

THE IRON AGE

THURSDAY, DECEMBER 13, 1888.

Improved Drainage Pump.

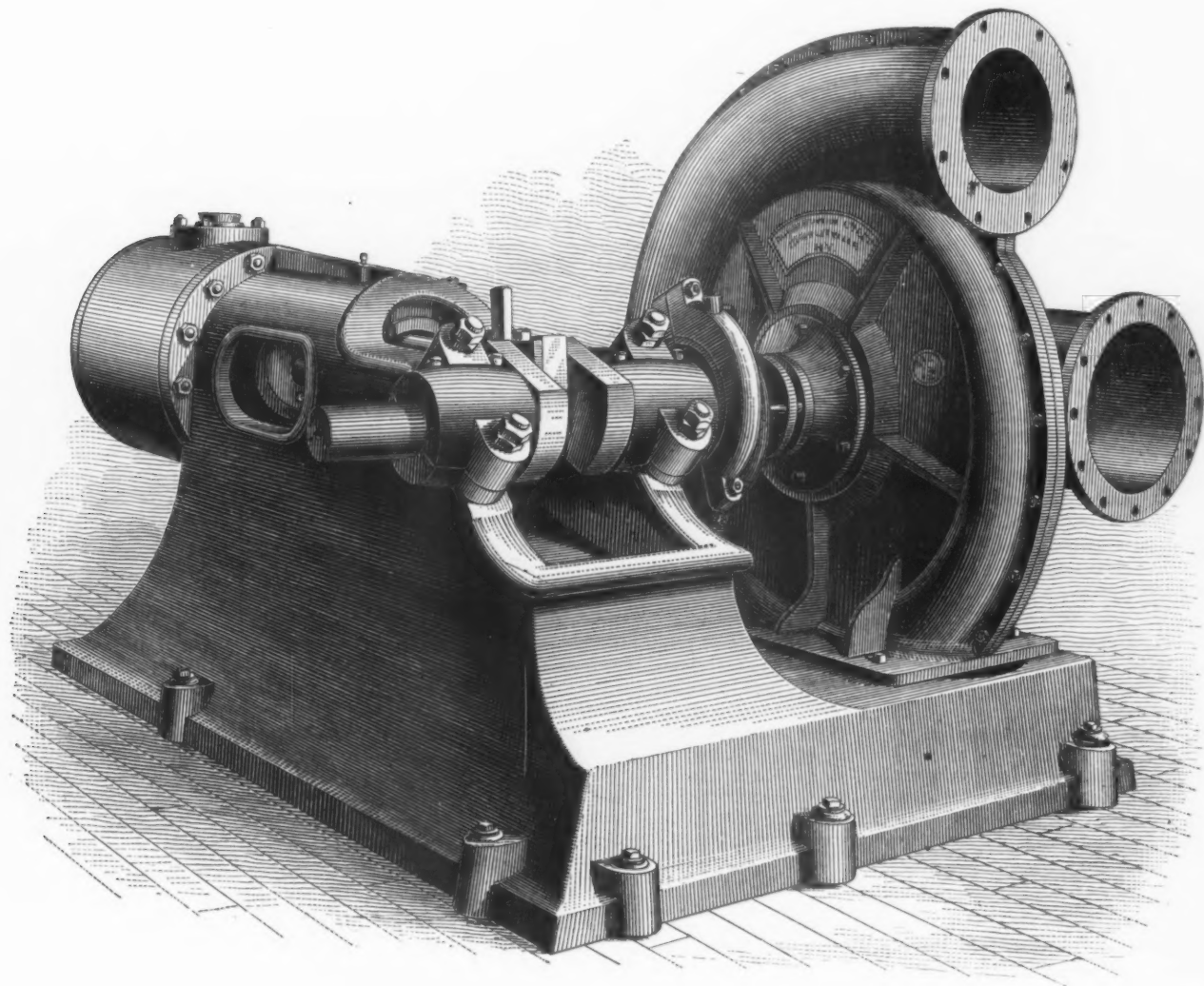
We show on this page one of a line of improved pumps for drainage, dredging and other similar purposes, built by the Morris Machine Works, of Baldwinsville, N. Y. It is known as their No. 12 direct connection pump for irrigation and drainage, and was originally intended to be used as a bilge pump for use on vessels. Having a capacity of 10,000 gallons per minute it was thought that it would serve a valuable purpose in case of collision. A hori-

zontal engine is used for driving. The union would seem to make a tight joint with comparatively light pressure.

A New 38-Inch Lathe.

Lodge, Davis & Co., of Cincinnati, Ohio, are building a new 38-inch lathe which embraces several novel features. Among these is the depth of bed, with liberal amount of metal in the upper and lower portions especially, and having the two sides tied together by diagonal braces

either direction. There is also automatic cross feed, these two feeds being so arranged that one cannot interfere with the other. The feed rod may be driven by gearing when desired, so that feeds can be obtained, ranging from 100 per inch to 5 per inch, in either carriage or cross feeds. No worm gear is used in the carriage apron. The feed rack is cut of steel. A stop is provided for automatically disengaging the feed at any predetermined point. The lead screw, as in all lathes built by this firm, is inside of the



DRAINAGE PUMP, BUILT BY THE MORRIS MACHINE WORKS, BALDWINVILLE, N. Y.

zontal engine is used for driving. It has a 17-inch cylinder, with 10-inch stroke, and can be safely run at a high speed. The whole outfit is compact and substantial.

Metallic Wire-Packed Unions.—Mr. John A. Prindle, of the Worswick Mfg. Company, Cleveland, Ohio, has brought out a novel and effective wire-packed union for pipes, &c. The essential feature of the device consists in a recess in the union with its interior wall perpendicular and its exterior wall inclined and a metallic wire packing with open ends, conforming in size and shape to this recess. The wire is preferably brass spring wire, and is bent into circular form. The ends of the wire are dressed accurately, so as to abut fairly, the wire being of such length that the ends meet when it is laid without

crossing each other, the object being to secure rigidity in resisting torsional as well as other strains. The head stock has a bearing upon, and is bolted securely to, the bed throughout its length instead of at the ends only, and the inside web is carried up as near as possible to the back bearing, which has to resist the thrust. The spindles are of steel, the main bearing being $5\frac{1}{2} \times 9$ inches and the back bearing being $5 \times 7\frac{1}{2}$ inches. The tail stock also has a bearing on the bed along its entire length, and is clamped by four bolts. For convenience in handling it is provided with a crank handle, by means of which, in connection with a pinion, the feed rack is employed for moving it. In addition to the inherent stiffness of the saddle the apron is secured to it in such a manner as to still further stiffen it. The compound rest has automatic feed at any angle in

bed immediately under the inside V and nearest the point of resistance. The nut is in two parts, which close upon it in the usual manner, working in a box, which forms a support for the screw as well. The screw is of steel, and geared to cut from 12 threads per inch to one thread in 2 inches. The nut, as well as all manipulations of the feed, including the reversal, is operated from the front of the carriage, special attention having been paid to ease and convenience of handling. A steady rest accompanies the lathe. It has four jaws, and is proportioned in keeping with the general design of the lathe. The countershaft has tight and loose pulleys, 24 inches in diameter for a 4-inch belt.

The lathes are made with various lengths of beds, advancing by 2 feet up to 24. The weight with a 12-foot bed is 12,000 pounds.

Collieries Between the Cumberland River and the Tennessee Valley.

The Cincinnati, New Orleans and Texas Pacific Railway passes over and alongside greater areas of coal and iron-ore bearing land than any railroad in the United States. Coming from Cincinnati it enters the great Cumberland coal field, a mile south of the Cumberland River, thence for 91 miles its track is entirely upon coal-bearing strata, and thence for 72 miles further south its track is never over a mile from coal-bearing strata, and a less distance from the well-known persistent vein of red fossil iron ore. Then passing Chattanooga and Wauhatchie for 198 miles, one side or the other, and frequently on both, are within 1 to 2 miles of veins of iron ore and coal. From Emory Gap to Dayton, 41 miles, is an unbroken vein of iron, ranging from 3 to 5 feet in thickness, and while it exists in many hills high above water level, actual mining operations have proven that it exists without diminution in quality over 225 feet below water level.

When the Cincinnati Southern was originally planned it was thought that Cincinnati might regain the trade which Louisville had drawn from her. A few enthusiasts told of the coal and iron, but the practical merchants of the Queen City thought that a mere nothing. Selling goods and buying produce was in their minds and eyes, yet it is probable that one-third of the traffic of the road is on these minerals. The facts which have been stated as to the Cincinnati-Southern Division are also true of the Alabama Great Southern Division, the coal, however, being nowhere in such close proximity to the ore, but the amount of ore is much greater. The vein of ore is continuous for very nearly 198 miles, and is at some points on both sides of the line, and is for a long distance from 20 to 25 feet thick.

We have stated that the line of the Cincinnati, New Orleans and Texas Pacific enters the coal-bearing strata about a mile south of the Cumberland River. The coal in section belongs to what is known in geology as the sub-conglomerate coals, being those seams existing in the shales and sandstones, between the lowest and greatest conglomerate and the limestone. These coals are wanting in many sections of country, but in the region now alluded to reach an unusual degree of excellence and regularity. The coal from what was called the Cumberland mines, on the river above the railroad bridge, was for many years boated down the river to Nashville, where it sold in the market for considerably more than any other coal. The first mine on this railroad is at Happy Hollow; the elevation of the track there is 998 feet above sea level, and the coal seam is 100 feet higher. The first well-defined show of the conglomerate is at Flat Rock, ten miles south of Happy Hollow. The track is there immediately upon it, and its elevation above the sea is 1300 feet. There is a general dip of all the strata and of course of the coal seams to the southeast. The elevation of track at Greenwood, three miles south from Happy Hollow, is 1200 feet, the Greenwood seam is a little higher, but the Beaver Creek mines are much lower. The natural inference from these data would be that the coal of all these mines, Happy Hollow, Greenwood, Beaver Creek and Barren Fork, are all below the great conglomerate which shows so plainly and so massively at Flat Rock.

As there has never been any thorough survey of the Tennessee coal field the exact dip of the strata to the southeast is not known, but it disappears forever among the horizontal strata after its well-defined appearance at Flat Rock, but is to be found in the vertical pitched-up strata of Walden's ridge. The disappearance of

this great geological age-mark demonstrates the fact that all coals to the southeast belong to the series above it and may be more certainly depended upon for permanence in area and regularity in thickness. As already stated, the first mining operation on the line of this railway coming from the north is that of the Cleveland Coal Company, at Happy Hollow. Compared with many others this mine is small, but there are none anywhere more elegantly located for handling coal quickly and cheaply. The track which goes to the coal-tipple is only 400 yards long, and the main entry is only about 150 feet from the top of the incline. The seam of coal ranges from 3½ to 4 feet in thickness. There are three entries into the mountain. The output is now about 150 tons per day. Fifty miners and 16 outside men of all kinds are employed. This mine is 172½ miles from Cincinnati. The chief market of their coal is Kentucky towns and cities. The capital invested amounts to \$50,000.

The next mine is Greenwood, 175½ miles from Cincinnati. This was one of the first mines on the road, having been opened in 1878, and it has been worked many years with varying fortune. The Greenwood seam of coal appears to be different from any other in the neighborhood; it is in an isolated series of knobs. In and around this mine about 440 men are employed. From Greenwood Station a wide gauge railroad runs down 6½ miles to Beaver Creek, where there is another mine owned by the same company. At this place 65 men are employed. Two miles east of Beaver the same company is opening a new mine, with which it is connected by a narrow gauge railroad. This coal and that at Beaver is much lower than the track at Greenwood, therefore the cars are lifted up to a tipple on an incline. Three steam engines are used in getting the coal from the mines to the main line at Greenwood. The total product is about 280 tons per day, of which Greenwood supplies about 180 tons. The entire output is taken by the railroad for its own use. The area of land owned by this company is 20,000 acres. The coal of the new seam being opened by this company is said to be identical with the famous Cumberland coal previously alluded to. An incident of the perils of old boating times is related by one of the men at the mine: On one tide 24 boats started out loaded with coal and only six reached Nashville. The great trouble lies with the falls of the Cumberland. A peculiarity in mining this coal is that no powder is used, the coal being prized out in cubical blocks. The seam will average 4 feet in thickness.

The next mine is Barren Fork. It is about 3 miles from the main line of the road, and is near Flat Rock Station. At this mine machines are used for mining. The output is about 10 cars per day, which is entirely sent to Kentucky markets. The Hellenwood Mine is 211 miles from Cincinnati in the State of Tennessee. It is the first of the mines that may be assumed to be above the great conglomerate. As the line of road comes into Tennessee, there is to be seen on the eastern side, rising to a very high elevation, a series of peaks and ranges, all of which contain coals above the conglomerate, and many rising high enough to contain some of the upper measure seams. This is especially true further south on the line, as in Morgan County only a few miles east rise the high mountains of the Crooked Fork country, which contain many valuable seams of coal. The Hellenwood has been opened for many years and worked with poor results. It is now leased by Mr. Fry. The cause of former trouble was a seam of bony coal in the middle, which was very hard to get rid of, but Mr. Fry writes that this has almost entirely gone out. The output is now about 60 tons per day. From 18 to 20 men are employed. This

mine is owned chiefly by parties in Chattanooga. The next mine is near Robbins Station, 218 miles from Cincinnati and 117 miles from Chattanooga. This operation is known as the Robbins Coal Mining Company. The same seam of coal is worked here as at Glenmary. The mine was opened July, 1887, and they have driven in a main entry 2500 feet. The seam ranges from 3 to 4 feet in thickness. The output averages 240 tons a day; 70 miners and 30 outside men are employed. The property is owned by persons in Chattanooga. It is their intention to erect ovens and manufacture coke. At Hoffman's Switch a small operation has been commenced, which will be of considerable importance when gotten into the hands of persons with capital sufficient to develop it. It is called the Ottburg Coal Company, and they have a lease on 1000 acres at the remarkably low price of \$100 per year.

The largest coal-mining operation on this division of the Cincinnati, New Orleans and Texas Pacific Railway is that of the Glenmary Coal and Coke Company. The mines of this company are located near Glenmary Station, 223 miles from Cincinnati and 112 miles from Chattanooga. The mines are 7300 feet from the main line, near the station-house. Of this distance 3500 feet is a standard gauge railroad to the coke ovens and tipple; thence a narrow gauge 3800 feet to the main entry. This mine was opened in 1880, and had a somewhat precarious existence for some years, but has been made a success under the excellent management of Col. John H. Clarke. The stockholders of the company reside principally in Kentucky, but some are in Chattanooga. Mr. G. W. Darnell, of Lexington, Ky., is president of the company, and Colonel Clarke is still superintendent. In 1881 there were shipped from this mine 45,000 tons, and 175 hands were employed, no coke being made. For the present year, 1888, the shipments of coal will average 400 tons per day, and of coke from 65 to 70 tons per day, while an average of 300 miners and 100 outside hands are employed. The length of the main entry, out of which the coal is brought, is but a poor indication of the system of underground railways inside, it being only 3300 feet, while one cross entry is 5000 feet long, and the total length of entries is 7½ miles. The seam of coal has improved in thickness the further under the mountain, and at 3000 feet is very regularly 4 feet thick. The coal is all brought to this main entry by mules, thence it is pulled out by wire rope. When "a trip" of 50 to 60 cars is made up, the little locomotive on the narrow gauge hauls them down to the tipple. In this handling so large a quantity at a time is one secret of the profitable operation of the mine.

This coal is very highly esteemed, and sells readily everywhere from Lexington, Ky., to Macon, Ga. The coke made is probably the best south of Virginia. Large quantities have been sent to Colorado and Arizona. It is made entirely from unwashed slack, and its analysis shows: Carbon, 91.00; ash, 9.00, and sulphur, 0.480. The company have not gone into the wild craze, too common in the South, of owning a large acreage not available for many years, but own only 3000 acres, a very large proportion of which carries the seam they are now working.

This is the last mining operation immediately on the road line until the railway passes into the Tennessee Valley.

It is estimated that nearly 40,000 square miles of the State of Colorado are underlain with coal, embracing every variety, from the soft, clean and beautiful lignites to the highly bituminous, semi bituminous and all grades of anthracite.

New Stationary Blast Forge.

The accompanying cut illustrates a new stationary blacksmith's forge, which was especially designed and built by the Buffalo Forge Company, of Buffalo, N. Y., for the Burton Car Company, Wichita, Kan., to meet their requirements for extra heavy work. It has a large deep fire-pan, 62 x 48 inches by 10 inches deep, with fire-pit 4 inches lower still, giving a depth of 14 inches from top of bowl to bottom of fire-pit, thus making it especially adaptable to handling large and heavy work. For light work the gates on side can be opened and fire lowered 4 inches.

The tuyere iron is extra heavy with a 3½-inch blast gate, fitted with an improved anti-clinker triangular ball for regulating the blast, and is designed especially to withstand heavy service without burning out. The water and coal boxes are cast in one piece with the fire pan, with a sloping partition dividing the two for easy removal of coal. Although the patterns for these forges have been completed only a short time, we understand that they have

Engineers and others, who have taken special interest in the work, and who know that a wind pressure of 56 pounds per square foot has been allowed for over the whole structure, would not expect any other result; but to the uninitiated the gale should certainly be reassuring. It is greatly owing to the necessity of providing for a large wind pressure that the bridge presents such a massive appearance, for the surface exposed to wind action is so large that there is a pressure of 8000 tons allowed for between the two cantilever end piers, due to wind alone; the stresses on the steel, however, from this and all other causes do not exceed one-fifth of the amount that would actually cause any part to fail.

The method of recording the force of the wind at the works is very complete. On the Island of Inchgarvie are placed three wind gauges or pressure boards, the larger one, 300 square feet in area, is fixed square to the east and west winds, and of the two smaller ones of 1½ square feet area, one is fixed as above, and the other is free to swivel square to the wind in any direc-

date of sales. The term 'regularly authorized agents,' used in the letter, was intended to apply only to agents who are practically officers of the furnace companies, and not to commission merchants, who are, I suppose, in a certain sense agents for all the furnaces. To avoid duplicate reports or misunderstandings of any kind, it is desired that sales made by commission merchants shall be reported through the furnace companies for whom they are made."

Rope Driving.

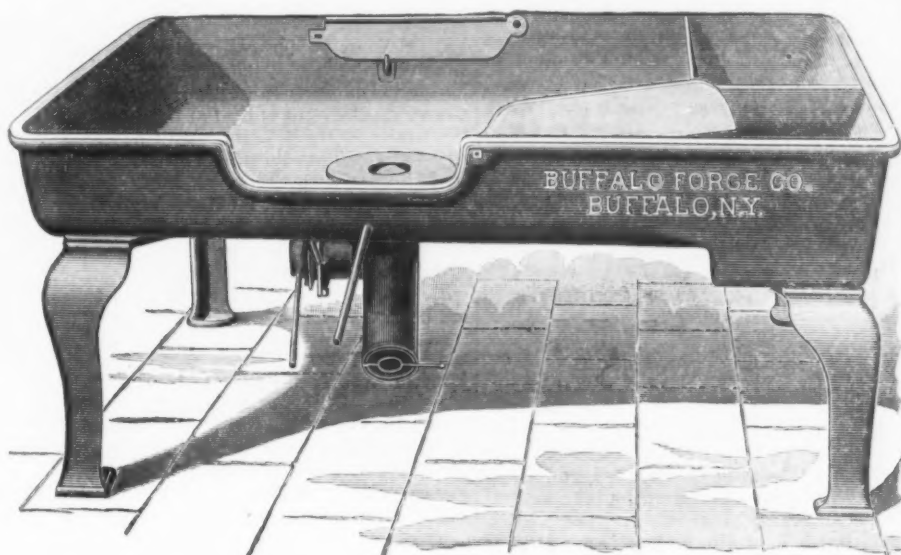
There are three types of grooves used in various works—one is the U-shaped groove for binder pulleys only, where the rope rests in the bottom of a semicircle large enough to hold it; another is the V-shaped groove, and a third is where the groove is approximately in the shape of an ellipse, the radius of the bottom groove being about 60 per cent. of the radius of the rope. The speed of such ropes is limited to about 5000 feet per minute, at which velocity the centrifugal force becomes a very important element in the capacity of the system for the transmission of power. The working stress of the ropes varies very widely in practice. As high as 500 or 600 pounds have been applied on a 2-inch rope, although the best practice limits the stress upon such a rope to about one-half of that amount. The following figures give the result of what has been shown to be good practice:

Diameter of ropes. Inches.	Working stress on one rope. Pounds.	Diameter of ropes. Inches.	Working stress on one rope. Pounds.
1½	247½	2 1-16	256
1 11-16	230	2 1-16	330
1¾	278½	2 1-16	349
1¾	330	2¼	305
1¾	363	2¼	330

The advantages claimed for rope driving are the absence of slip, the ability to turn the corners and to run to any desired distance; the cheapness of cost, it being about two-thirds that of leather, and also economy of maintenance. On the other hand, it is claimed that the mechanical efficiency of rope driving is not so high as by belt driving, that the power required to press the rope into the grooves, and then to pull it out as it leaves the pulley, is a large element in the problem, and also that the ropes are subject to a greater degree of wear than is estimated by their advocates. There is also a difference by reason of the fiber used, and ropes made of manila will not give results equal to those of cotton, unless the manila has been laid and treated especially for the purpose.

The contract for the ironwork of the reconstructed Chamber of Commerce building, on the corner of La Salle and Washington streets, Chicago, has been awarded to Vierling, McDowell & Co., of the same city. They have sublet the contract for the beams, girders and other wrought work to Jones & Laughlins. Steel alone will be used, and from 1200 to 1500 tons will be required. The original building has been remodeled to contain five stories, and a new superstructure of eight stories and an attic will be added. The whole building will then consist of thirteen stories, a basement and an attic, and will be one of the tallest buildings in Chicago, or probably the tallest. The alterations are to be completed by the 1st of August next. The building will be exclusively used for offices. Baumann & Huehl are the architects. The Chamber of Commerce Vault Company are the owners.

The connecting-rod of the new Puritan is a forging 40 feet long and weighing, finished, 21 tons.



NEW STATIONARY BLAST FORGE, BUILT BY THE BUFFALO FORGE COMPANY, BUFFALO, N. Y.

already been supplied to the American Brake Company, St. Louis, Mo.; Binghamton Wagon Company, Binghamton, N. Y.; Mexican National Railroad Company, and others, thus indicating their advantages for wide range from light to heavy work.

Wind Pressures on the Forth Bridge.

Mr. I. E. Tuit, of the Forth Bridge Works, writes as follows in the *Scotsman* with reference to the effect of the recent gales in Scotland on the Forth Bridge:

That the high winds that have prevailed for the last few days could in any instance have been serviceable is not easy to believe, yet they should be the means of inspiring confidence in a great number of minds when it is known that the Forth Bridge has withstood their power without sustaining the least damage. Of course some part of the timber stagings used for the purposes of erection, and also small wooden houses built for shelters for the men, which were situated on exposed parts of the structure, have been damaged; but the steelwork of the bridge itself has not suffered at all, and although about 100 cranes are distributed over the work, not one has sustained any injury. The total damage, indeed, can be made good with two loads of boards.

tion. There are, in addition to these, some half-dozen others distributed over the works. The greatest pressure recorded during the present gale was on Friday, the 16th inst., when it was 27 pounds per square foot on the large board of 300 square feet area; 41 pounds on the small fixed; and 35 pounds on the movable boards. The wind, being southwest, did not strike the fixed board at right angles. At the other parts of the bridge an average pressure of 32 pounds per square foot was recorded. It will therefore be seen that the greatest pressure during the present gale, as recorded by the largest pressure board at the bridge, was not quite half that which has been allowed for in proportioning the various members of the Forth Bridge.

T. H. Carter, Commissioner of the Southern Railway and Steamship Association, has issued the following circular: "I am advised by a number of the furnace companies that it will be impracticable to report sales of pig iron within three days from date thereof, and there is a general expression of opinion from furnaces thus far heard from that the time within which sales may be reported should be extended to ten days, instead of three days, from date of sales. My letter of the 17th inst. is, therefore, modified so far as to allow, when necessary, as much as ten days from

Copper for Electrical Purposes.

Referring to the Elmore process of turning out electrically deposited copper pipes, *Engineering* says:

The advantage to be derived by obtaining the best copper was perceived in the early days of submarine cable enterprise, and over 20 years ago Dr. Matthiessen carried out a series of careful and valuable experiments in order to fix a standard to which the various samples of commercial copper could be referred. By using elaborate precautions he obtained the purest copper that was then practicable, and determined that a pure hard-drawn copper wire 1 m. in length and 1 gram in weight should have a resistance of 0.1469 ohm at the temperature of 0° C. This standard has been in use up to the present and has been believed for many years to be the extreme limit of conducting power for copper. But, owing to the great care that has since been bestowed by copper manufacturers, this standard has occasionally been surpassed, and by the introduction of the improved method under consideration has been rendered obsolete. Some of the early cables possessed a very low conductivity, but year by year steady improvement has been shown, until at the present date copper having a lower conducting power than 96 or 98 is rarely accepted.

In order to obtain the best quality of copper for cable and other electrical purposes the practice of late years has been to get electro-deposited copper in the usual manner, and then to exercise the greatest possible care in melting it for casting into "wire bars," which are then drawn into wire. A very small amount of an impurity, such as arsenic, antimony, sulphur, phosphorus, &c., gaining access to the metal at once greatly reduces the conductivity. At Birmingham, Swansea and other places dynamo machines and tanks are at work depositing scores of tons of copper weekly, but the metal produced, although pure, is of the usual granular or crystalline texture of electro-deposited copper, and possesses very little tensile strength and cohesiveness. Therefore, as above stated, it is necessary to melt it into "wire bars," and even if the greatest care is exercised the metal must deteriorate in the process.

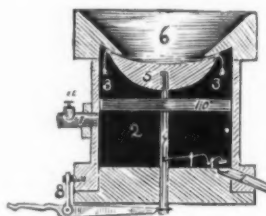
The new method has the important advantage that impurities have no opportunity of gaining access to the metal. By the nature of the process it is necessarily and unavoidably pure. Special machinery has been arranged so that an electro-burnished tube of any desired length, diameter and thickness can be cut spirally into a square wire, which can then be drawn down in the usual manner to any required diameter. The wire being drawn directly from the electro-burnished tube obviates entirely the necessity for melting, and thus constitutes altogether a new departure in the manufacture of pure copper wire. Some of the tests to which it has been subjected are very interesting. Two large coils of the new wire were taken, the wire of the first having a diameter of 0.113 inch (about 12 B. W. G.), and the second a diameter of 0.05 inch (about 18 B. W. G.), both being extremely hard-drawn. In order, however, to be perfectly satisfied that the practical limit of hardness had been reached, the larger wire was drawn through 13 holes in a draw-plate (the last hole being of agate) without annealing, until the diameter of the wire was reduced to 0.057 inch. Its hardness may be judged of by the fact that the breaking strain was 29 tons per square inch with an elongation of only $\frac{1}{2}$ per cent. The No. 18 B. W. G. wire had a breaking strain of nearly 29 tons per square inch, with an elongation of only $\frac{1}{2}$ per cent. When these wires were annealed they showed an elongation of 25 to 33 per cent. before breaking.

The hard wire is admirably adapted for overhead telegraph wires, possessing the

two requisites of great strength and high conductivity. The efficiency of dynamo machines and electrical instruments can be increased because a greater number of "ampère turns" can be got within a given space. The copper tape or ribbon used so extensively for lightning conductors can be cut direct from the tube of any length and sectional area by the special machinery before mentioned.

Lister's Tuyere Iron.

Messrs. Peter Lamp & Co., of Davenport, Iowa, have just brought out an improved form of tuyere iron, of which we annex a cut. This clearly explains the construction adopted. No. 2 is the air chamber; 1, the tube where the blast is forced in from the bellows; 3, the air passage where the arrows are marked, and through which the air is forced up into the basin; 6 shows where the fire is placed; 5 is the cup which is placed under the basin, and is held in place by a rod, 4, crossbar 10 and runs down through the bottom of chamber 2, and is raised and lowered by lever 9. The latter is held in place by post 8; 7 is a tube put in close at the bottom of the chamber, so as to blow out any particles of dust or melted iron that might overflow the cup. This tube is stopped up with a plug when the fire is being used. When the fire is



Lister's Tuyere Iron.

not in use the plug is removed, and draft enough will pass through the tube and up the chamber and into the fire, and will, it is claimed, keep the fire alive for two or three hours. By removing the plug the fire is always ready for use. No. 11 is a check-valve placed close to the nozzle of the bellows, so that the cup 5 can be set in a fixed position, and the blast can be regulated by the check-valve to suit the kind of work. The flange around the basin is left with a flat surface, so that a wrought-iron band can be shrunk on to prevent the casting from cracking with the heat, making the whole tuyere iron more lasting and durable.

The device is made in five sizes, the smallest for use by common horseshoers, and the largest in railroad shops, &c. It is in use at the United States Arsenal, Rock Island, Ill.

There were up to last June three blast furnaces in operation in all Canada. Within a year from now there will be ten working full time. Two of them will be situated in Montreal, and the other five scattered, principally through western Canada. The *Pittsburgh Times* says, the places where they will be located are so far kept quiet, as the contracts are not yet definitely concluded. The principal firms so far interested are J. P. Witherow and the Swindell Construction Company.

The Pratt & Whitney Company have lately put on the market a most ingeniously designed automatic grain scale, which will be found a very convenient machine for warehouses, mills, elevators and other places where means of weighing grain quickly and accurately are needed. A large bucket hanging in a frame receives the grain, and when a certain weight is in

the stream is automatically shut off and the load dumps the bucket. No springs of any kind are used in the machine, the movements being operated by gravity alone.

The Temple Water Tube Boiler.

A recent issue of *Industries* contains illustrations of a type of water tube boiler which, although introduced in France more than two years ago, is but little known in this country. It is the invention of M. Felix du Temple, a French naval officer, who devised it with the primary object of replacing the boilers of the locomotive type generally used on torpedo boats. The boiler was first tried on the torpedo boat No. 20 in the French navy, and appears to have given complete satisfaction, inasmuch as 27 trial runs were made with this boat without necessitating repairs of any kind to the boiler; and in view of this performance, the French Government have ordered a 500 horse-power boiler of the same type, for their torpedo boat No. 54. The heating surface consists of a large number of drawn steel tubes 0.4 inch in external diameter, and bent into a zig-zag form, with their upper ends connected to a steam collector, and their lower ends to a rectangular water tube. The latter is outside of the furnace; but the steam collector is heated by the escaping fire gases, by which means thoroughly dry steam is produced. The boilers are made either with two water tubes or with one water tube only, and are accordingly classed as double or single boilers. The furnace of the boiler is protected by a fire-brick setting contained in an iron casing, which is carried up and forms the boundary of the flues. The feed water is introduced at the forward end of the rectangular water tubes. These tubes are also joined by a breeches pipe in front with the lower part of the steam collector. As the water in the small tubes is evaporated, and ascends in the form of steam into the collector, its place is taken by water flowing down the breeches pipe into the horizontal water tubes, and thus a very efficient circulation is kept up. The inventor claims that by making the zig-zag tubes very small in diameter the danger of any of these tubes exploding is greatly minimized, while the rapid circulation due to the small diameter prevents the accumulation of sediment. The deposition of sediment is limited to the collector and rectangular water tubes, and can be removed by the blow-off cock shown at the back of the boiler. The zig-zag shape of the small tubes provides for their expansion and contraction, without putting any sensible strain on the other parts of the boiler. Owing to the small quantity of water contained in the boiler, steam can be raised very quickly. The inventor claims that a 500 horse-power boiler can be put under pressure in three-quarters of an hour, and that its total weight does not exceed 5½ tons, or about 25 pounds per horse-power.

In relation to the reported delay in the work upon the battle-ship *Texas*, Secretary Whitney says the plans of that ship are not wrong in any respect. After Mr. Bryce-Douglas, the great engineer who designed the engines of the *Etruria*, went to the Barrow Shipbuilding Company as designing engineer, he began to overhaul the designs of the *Texas*, and asked for more displacement. The Department deemed it wise to add to her length from 10 feet to 15 feet for the sake of getting more speed. With the 10 feet additional length the *Texas* will be only up to the displacement of the *Maine*, her sister ship. The delay in her construction, Secretary Whitney says, is rendered necessary by the fact that the new tools and machinery have been delayed in delivery.

The Deane Duplex Pump.

We illustrate on this page a duplex steam pump, as built by the Deane Steam Pump Company, Holyoke, Mass. It is designed for fire service or other uses where a heavy and uniform pressure is required. Prominent features in this design are strength, compactness of arrangement and convenience of access to the working parts. When used upon sprinkler systems an automatic device can be obtained with the pump for controlling its action. The internal arrangement of these pumps

40-ton guns which are to be exhibited by the Minister of Marine. The track will be of the Decauville system, the steel rails being riveted to steel cross-ties. A part at least of the line will be laid with the "portable" track.

Iron Making at Bilbao.

One of the British consular reports contains the following data in iron making at Bilbao, Spain: The Altos Hornos Company have three blast furnaces, producing

tion broke up in February last through the Vizcaya Company producing in excess. The export of pig iron will probably fall off through producers not being able to compete in foreign markets—Italy excepted—and through the home demand, Bilbao pig iron having already driven out the English. The attention of producers is now more particularly directed toward promoting in the country various metallurgical industries.

The Altos Hornos Company, established in the year 1885, built the first Bessemer mills and rail mill. The works are now busily engaged for home supply, and already rule the home market. During 1887 the company were also putting up new plant for making open-hearth steel plates. The Vizcaya Company are erecting plant for a similar purpose, and also for the manufacture of galvanized buckets, sheets, tin plates, &c., a new industry in Spain. It is doubtful whether, in spite of the duties protecting this industry, it will be able to compete with English manufactures. The Spanish Government have called for tenders for the construction of three cruisers, on the understanding that preference would be given to local shipbuilding yards, foreign or native. The offers are three from the Bilbao iron works, two English and one French. Without waiting for the decision, an English company, the Naval Construction and Armament Company, have commenced the construction of a shipyard close to the Altos Hornos works, relying on the support of some Spanish firms, and expecting to obtain orders for cargo, mail and passenger boats from the steam navigation companies in Spain. From the many new lines of railway, the animation of different industries and the general satisfactory prospects there appears to be a good field for British enterprise here. Except mining, all industries in the Basque provinces are exempt from taxation, and foreigners enjoy the same immunities, privileges, &c., as natives. Many of the frontier mines in the districts of Galdames, Gallarta and Somorostro, hitherto contributing largely to the exportation of ore, are becoming exhausted, and probably will be worked out in a few years. As they decline rich mines in the adjoining Sopuerta district will be developed. Extensive preparations are being made for their working and the shipment of the ore via Castro, Poveda or Bilbao-luir.

The most favored project of several is to bring the Santander Railway to Bilbao via Trucios, through the Sopuerta Valley—12 miles—and join the Deputacion Railway. If the scheme does not succeed capitalists and mine owners of the district purpose to make this railway by a private company, and in anticipation some mine dealers are getting hold of mining properties. Capitalists should be on their guard, and satisfy themselves through trustworthy sources as to the real ownership, importance and value of any mining property offered for sale. The works for the construction of a port outside the bar are to be commenced according to the plans, and under the direction of the engineer of the port, Don Evaristo de Churrua. The port, though not so spacious as those proposed by Sir John Cooke and Mr. C. Vignoles, will be one of the finest commercial and naval ports in the world, and a harbor of refuge for the whole of the Cantabrian coast. A breakwater is to be made from the southwestern coast, starting at a point 2025 yards from the old signal tower of Portugalete, running in a north-westerly direction 1039 yards, then turning at an angle of 160° for a distance of 547 yards. From Begona Rocks, on the northeastern side, a counter breakwater is to proceed in a west-southwesterly direction for 1172 yards. The entrance will be between the breakwater and counter-break-

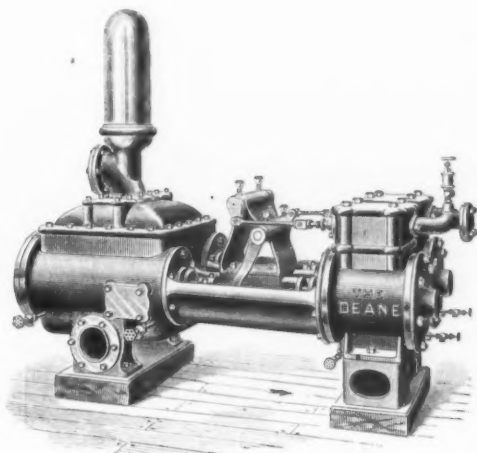


Fig. 1.—General View.

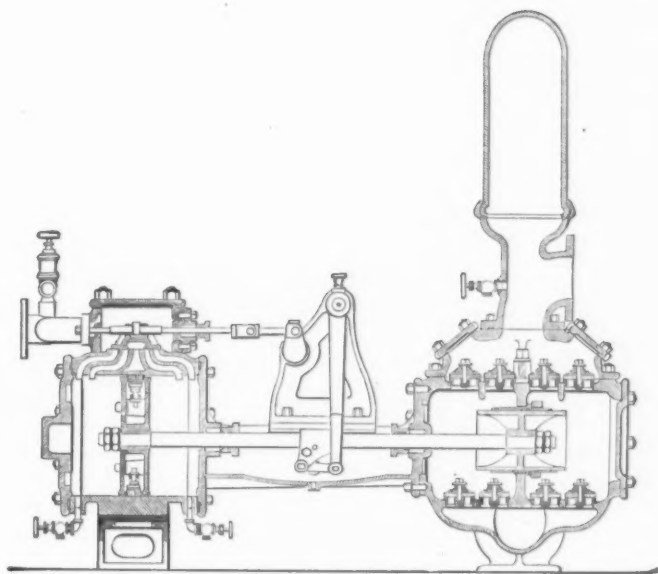


Fig. 2.—Longitudinal Section.

THE DEANE DUPLEX PUMP, BUILT BY THE DEANE STEAM PUMP CO., HOLYOKE, MASS.

is shown in the sectional view. In the steam piston may be seen the means for adjusting the packing rings. The action of the valve motion is also clearly indicated. In the water cylinder, it will be noticed that all the passages are direct and of ample size.

Small compound locomotives are to be used for hauling freight to the Paris Exposition of 1889. M. Decauville, the builder of portable railway plant and equipment, has issued a circular stating that there will be about 12½ miles of track of 22.68 inches gauge laid with rails weighing about 14 and 20 pounds per yard. The cars will be hauled by compound engines weighing 5½ tons empty and 12 tons in working order. Over these lines will be transported the

on the average 1800 tons a week, and export only the quantity produced in excess of their own requirements. To make 1 ton of pig iron requires from 17 to 18 cwt. of coke. The San Francisco Company have four blast furnaces with 13 Whitwell stoves. The pig iron produced amounts to 1200 tons a week, requiring from 19 to 20 cwt. of coke to the ton. The Vizcaya Company possess two blast furnaces, producing 1200 tons of pig iron a week, requiring about 18 cwt. of coke per ton. In 1887 the exportation of pig iron from these works increased by 76,368 tons, or 178½ per cent. Of this amount seven-tenths went to Italy, one-tenth to France, one-tenth to Russia. The above three works formed a syndicate for the sale of pig iron in Spain, but the associa-

water, face toward the northeast, be 2000 feet wide, and have a depth of water at low neap tides of from 39 feet 6 inches to 49 feet. The available space for mooring purposes, &c., will be 1540 acres on each side, and the estimated cost of the works is £1,200,000, to provide which the Spanish Government has sanctioned a duty of 2½d. per ton on iron ore exported, and granted an annual subvention of £10,000 for 12 years, the remainder being made up by the local municipalities and provincial deputations.

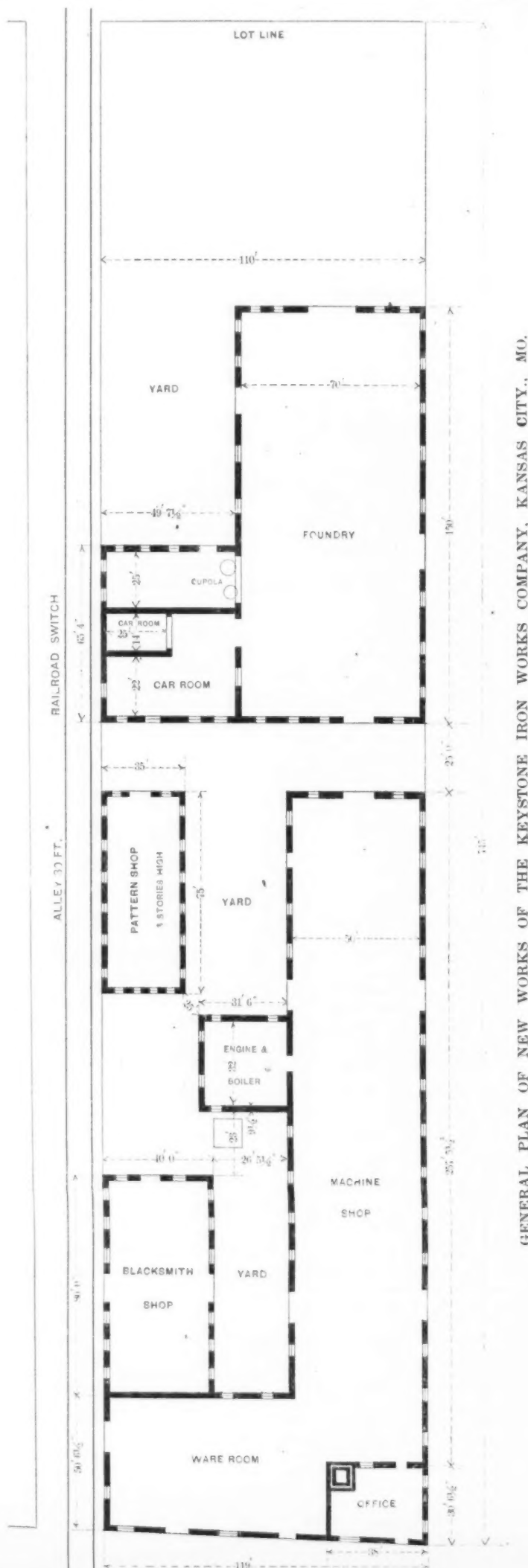
The Keystone Iron Works.

We present on this page a general plan of the new works of the Keystone Iron Works Company, of Kansas City, Mo., builders of boilers, engines and general machinery, and also manufacturers of ornamental iron and brass work. The engraving explains the whole arrangement, and calls for little remark.

The new works are practically completed, and ready for occupancy, the completion of railroad facilities being the only thing which is now awaited before removing to the new establishment. A new 120 horse-power boiler has been put in, and a new 100 horse-power automatic engine for general power purposes. The foundry is equipped with a 35 horse-power engine and boiler combined. A new 30-ton cupola has also been erected here, and the machine shop has been equipped with a very complete set of tools. It is the intention of the company to have a full line of traveling cranes and trolleys for handling all their work. When in full blast, the works employ 400 men, and are prepared to make the largest and heaviest castings required in the West. We need simply add here that the office building is two stories high, and contains accommodations for the drafting department. The works are now supplying material and machinery as far West as Idaho, and as far East as Buffalo.

A Curious Panorama.

A curious panorama is to be provided at the Paris Exhibition next year by the Compagnie Générale Transatlantique, to represent its fleet of steamships. The panorama, or, as we have been taught to call it, cyclorama, is to be painted by M. Poilpot, who, according to the *American Architect* and *Le Génie Civil*, has already painted such views to illustrate the War of Secession in the United States, and, for all we know, may be identical with the eminent M. Philippoteaux, familiar to the American public as the artist of the "Battle of Gettysburg," the "Siege of Paris," and other cycloramic works which have made the tour of the United States. The Compagnie Transatlantique's cyclorama is to be mounted in a circular building by itself, and affords some novel effects. The spectator, on ascending the stairs, emerges upon what appears to be the deck of one of the newest and largest steamers of the fleet, the Touraine, which is now in process of construction. Around him are masts and rigging of the vessel, and he can hold by the shrouds and look over the bulwarks at the sea, which extends to the horizon. On one side can be discerned the red roofs of Havre, and lying at anchor at different distances are the other ships belonging to the company, while the illusion is heightened by the mists which obscure the background. In order to surprise and dazzle the spectator, which is important to the effect of a panorama, an ingenious device is used to detain him in the dark passage-ways leading to the fictitious ship's deck, in the shape of dioramas, or illuminated pictures, to be looked at through a lens fixed in the side



of a box. Seven of these are provided, representing the ship-building yard of the company at St. Nazaire, the embarkation of emigrants, and various scenes on board one of the great vessels during a voyage. All of them are interesting, and the visitor moves slowly through the darkened passage-way, looking successively into the lenses, until his eyes have become accustomed to the feeble light, and the pupil has expanded so much as to be quite overwhelmed with the brilliancy of the great cyclorama, on emerging on the platform.

Lake Ore Shipments.

The Marquette *Mining Journal*, summing up the Lake Ore season from the shippers' standpoint, says:

Lake shipments for the season are practically at an end, and the figures show that the Lake Superior mines have sent more ore to market by water this year than in any previous year in their history. At this date a year ago, the last cargo for the season had gone forward. This year's shipments to date are 210,577 tons in excess of the total for 1887, and this will be slightly increased by a few cargoes yet to be reported from Escanaba. Compared with the shipments of 1886, the difference in favor of the current year is 1,107,248 tons. The rail shipments this year are known to be larger than ever before, so that it is entirely safe to estimate the output of the Lake Superior mines for 1888 at 5,000,000 tons, or about 300,000 tons more than their production in 1887.

The depression that prevailed during the earlier months of the season, and the improvement that set in later can be traced from the following figures, showing how the shipments of this year and last compared, month by month: On June 1 the mines were 90,837 tons behind the shipments by water on the corresponding date in 1887; on July 1, 161,905 tons; and on August 1, 245,065 tons. The reaction then set in, and September 1 saw the difference in favor of last year reduced to 222,887 tons. By October 1 it was cut down to 139,880 tons, and by the 1st of November it was not only wiped out, but a gain of 27,973 tons over last year had been made. This has since swelled to 210,577 tons, with the shipments yet to be reported to be added, to make the full excess over last year.

By ranges, the shipments are as follows:

Range.	1888.	1887.
Menominee	1,111,230	1,154,110
Marquette	1,815,402	1,755,328
Gogebic	1,223,334	1,081,872
Vermillion	433,607	302,081
Total	4,583,563	4,393,391
By port shipments have been:		
Port.	1888.	1887.
Marquette	844,694	803,411
Escanaba	2,181,452	2,072,708
St. Ignace	107,399	91,544
Ashland, Wis.	1,016,414	1,040,727
Two Harbors, Minn.	450,475	390,467
Total	4,600,434	4,398,857

Fourteen of the larger mines of the Marquette, Menominee, and Gogebic ranges have shipped by lake this season a total of 2,658,066 gross tons of iron ore, the shipments of each being as shown in the appended statement:

Name of mine.	Tons.
Lake Superior, Marquette range.....	228,593
P. & L. A., Marquette range.....	223,414
Republic, Marquette range.....	201,382
Cleveland, Marquette range.....	181,706
Champion, Marquette range.....	167,143
Chapin, Menominee range.....	267,729
Florence, Menominee range.....	139,421
Vulcan, Menominee range.....	129,541
Dunn, Menominee range.....	112,358
Iron River, Menominee range.....	107,143
Norrie, Gogebic range.....	379,204
Colby, Gogebic range.....	202,435
Aurora, Gogebic range.....	176,777
Ashland, Gogebic range.....	141,218
Total.....	2,658,066

This is over half the entire quantity shipped by water this season from all the mines in the Lake Superior region. The mines of the Vermillion range are omitted from this enumeration of the larger mines and their work, for the reason that we get only a "lump" report of the shipments from Two Harbors, Minn., and cannot, therefore, give the shipments of any of the mines on that range separately.

NEW PUBLICATIONS.

NOTES ON THE COMPRESSIVE RESISTANCE OF FREE STONE, BRICK PIERS, HYDRAULIC CEMENTS, MORTARS AND CONCRETES. By Q. A. Gilmore, Ph. D. Published by John Wiley & Sons, 8 vo. \$3.50.

This was the last published work of the author, general and engineer. At the time of his death he was probably the highest authority in the United States on the subjects of limes, cements, concretes and building stones. He had been employed by the Government on the reconstruction of the seacoast defenses, and on important river and harbor improvements, and had written several valuable treatises on these subjects.

The first chapter of this work gives a brief history of what had previously been done in testing these materials. It appears that a machine that would weigh no more than 100,000 pounds had not sufficient capacity to determine with sufficient accuracy the law of resistance, since crushing would be confined to small pieces. In Chapter II, notice is made of the A. H. Emery testing machine at the Watertown Arsenal, which weighs 800,000 pounds with extreme accuracy, and of the preparations made to use this machine for his tests. There are about 95 pages of experimental work upon various stones, cements, &c., and of various sizes, followed by a "summary", consisting of conclusions and suggestions. There are also eight folding strain sheets, which show to the eye the general law of resistance.

There is little to criticize and much to commend in the treatise. The extreme delicacy of the Emery machine, enabled the experimenter to measure with accuracy the amount of compression for the corresponding loads, and thus determine the elastic limit and the resistance of the specimens, which quantities were determined for the first time in the history of this science. (See pages 92 and 93, and elsewhere.) The elasticity of mortar and concrete is far from being perfect, and the term "elasticity" can be used, in regard to them, only in a restricted sense (page 91). Taking for the elastic limit that value beyond which there is a very decided change in the rate of compression, it is found that the modulus of elasticity of the mortar tested varied from 437,000 to 653,000 pounds per square inch, giving a mean of over 500,000 pounds. And concrete gave a mean of over 650,000 pounds. Dyckerhoff Portland cement gave a modulus of elasticity of 1,525,000 pounds to the square inch. This approximates to the value for good timber. The author finds a great difference in the resistance of cubes of stone and cement depending upon the beds, or substance interposed between the specimen and the machine. He finds that wooden cushions are not favorable, since they induce cleavage along the direction of the fiber. A thin coating of some material like plaster of Paris is essential, in order to secure uniformity of results. It was found by earlier experiments with Bera sandstone that the strength of cubes varied as the cube root of their edge; but this law was not confirmed by experiments upon larger cubes of Haverstraw freestone. Indeed, the question whether the compressive strength per square inch is greater for small cubes exceeding 1 inch than for larger cubes

if the material be homogeneous remains undecided. For a prism of less height than a cube having the same base, the resistance is greater. All the conditions of the experiments are clearly set forth, the results tabulated, and the conclusions properly based on the results of the experiments.

De V. W.

TWENTY YEARS WITH THE INDICATOR. By Thos. Pray, Jr. Size, 6½ x 9 inches. 284 pages. Published by John Wiley & Sons. Price, \$2.50.

We need not refer at any great length to Mr. Pray's work on the indicator, the book having been before the public for several years, and having, at the time of its first appearance, been widely noticed. The point to which attention is to be specially directed is that the two volumes of which it consists, and which have heretofore been published separately, have been combined, and are now offered under one cover. The greater convenience of this, in several respects, will be readily appreciated. The lessons in the book are drawn from actual practice, a circumstance which materially increases their interest and value over purely imaginary cases, and a large number of diagrams, taken under the most widely varying conditions, are presented. In addition to the subject proper, other details of steam engineering, such as feed water tests for boilers, measuring chimney draft, safety valve problems, &c., are considered, and steam and hyperbolic logarithmic tables are added.

BOILER CATECHISM. By Robert Grimshaw. Size, 4 x 6 inches. 402 pages. Published by the Practical Publishing Co. Price, \$2.00.

Mr. Grimshaw's "Boiler Catechism" is similar in character to his several pump and steam engine catechisms published within the past few years, and noted by us in earlier issues. It is intended for what are currently known as practical men, boiler attendants in other words, and the more advanced reader will therefore, scarcely find in it what he might be led to expect in a work on boilers. The information is given in the shape of answers to questions, such as are apt to suggest themselves to one in charge of a boiler in the course of every-day work. It will be apparent from this alone, that the book must necessarily contain considerable material of practical value, and an examination will, in a great measure, confirm this. Altogether, the end aimed at has been fairly well accomplished, and the information given will, no doubt, prove serviceable to many.

Referring to the exception which has recently been taken by English papers to the statement that the 335-foot boiler chimney of the Clarke Thread Company, at East Newark, N. J., is the tallest in the world, it may not be amiss to point out that the chimneys at St. Rollox and Port Dundas, near Glasgow, Scotland, which rise to 436 and 454 feet, respectively, are not boiler chimneys, but were designed and built simply to carry off noxious vapors from chemical works. The East Newark chimney, therefore, still stands unparalleled as a means of producing draft for steam boiler furnaces and the original claim to distinction is fully substantiated by facts.

According to *Engineering*, the recent sale of the hull and fittings of the steamer Great Eastern realized over £43,000, the copper bringing £2960, the gun-metal, &c., £4480; brass, £3980; lead, £4185; outer iron plates, £12,500; inner iron plates, beams and rivets, £12,230, and anchors about £300. The breaking up of the steamer will commence on January 1, will occupy a year and will probably cost in labor from 10/ to 15/ per ton of material.

New Lake Tonnage.

The Cleveland *Plain Dealer* publishes tables showing the new tonnage for 1888 in the great lakes and the losses of lives and shipping during the season. It says: The season of 1888 will be memorable in the history of lake navigation for many reasons, not least of which is the light loss of life and property from shipwreck. Old mariners fail to recall the time when the season, as a whole, has been so free from disastrous storms. November, the month most dreaded by mariners, passed without a blow worthy of being called a gale. A list of lost boats foots up 48, with a carrying capacity aggregating 17,700 tons, and a total valuation of \$439,400, but these figures represent barely half the losses of 1887, when 70 boats, capable of carrying 34,400 tons, and valued at \$777,700, went out of existence. A year ago 116 souls went to the bottom in a series of ruinous storms that swept over the entire chain of lakes, while this year only 16 lives were lost from actual shipwreck.

The season of 1888 has gone, and the surroundings capable of indicating the prospects for next year are of prime interest. For three years past the strides made in navigation on the great inland water has been a surprise to this whole country, and it is only of late years that this national industry has received a fair part of the attention which it deserves. In the winter of 1886-87, when 31 boats, valued at something more than \$4,000,000 were turned out of the shipyards of the lakes, the attention of the whole country was directed in a measure to the importance of a business that interests Cleveland particularly, and when a year ago the large volume of new work was followed by 60 more ships, capable of carrying 108,525 gross tons, and costing \$8,325,000, grave fears were expressed by the vessel owners and shippers as to "whether the thing was not being overdone." The vessels were floated, and their owners have tied them up for the winter abreast of sister ships that have seen more time of service with a profit for all that will compare favorably with that of any other branch of business in this country. It is sufficient to say that the earnings of lake carriers during the past season, together with prospects of the future, are such as to cause arrangements for a duplication of last winter's work in the shipyards of the lakes during the winter at hand. Fifty-nine boats, with a carrying capacity of 100,950 gross tons a trip, and costing \$7,124,000, will be put afloat some time between now and the middle of next summer.

One big craft, worthy of mention, but not included in the list, on account of the peculiar business to which she is adapted, is a big steel ferryboat, now about completed at the yard of the Cleveland Shipbuilding Company. This remarkable steamship will cost, when complete, about \$325,000. She will be used to convey the trains of the Michigan Central Railway across the Detroit River. Twenty-four loaded cars is her capacity. She will be propelled by monstrous power, and she is constructed so as to go through ice of 2 feet in thickness. The owners of this boat will send her across Lake Erie about January 1, and they express no fear of the ice obstructing her passage.

Bronze for Copper.—*La Nature* gives the following receipt for bronzing copper: "Dissolve in 50 litres (11 gallons) of hydrochloric acid as much as possible of iron in fine wire or scales. When the liquid is saturated a deposit will form at the bottom. Then add 1 kg. (2.2 pounds) of arsenious acid, and stir vigorously. When the acid is dissolved the bath is complete. The objects to be bronzed are connected to the negative pole of a battery, the oppo-

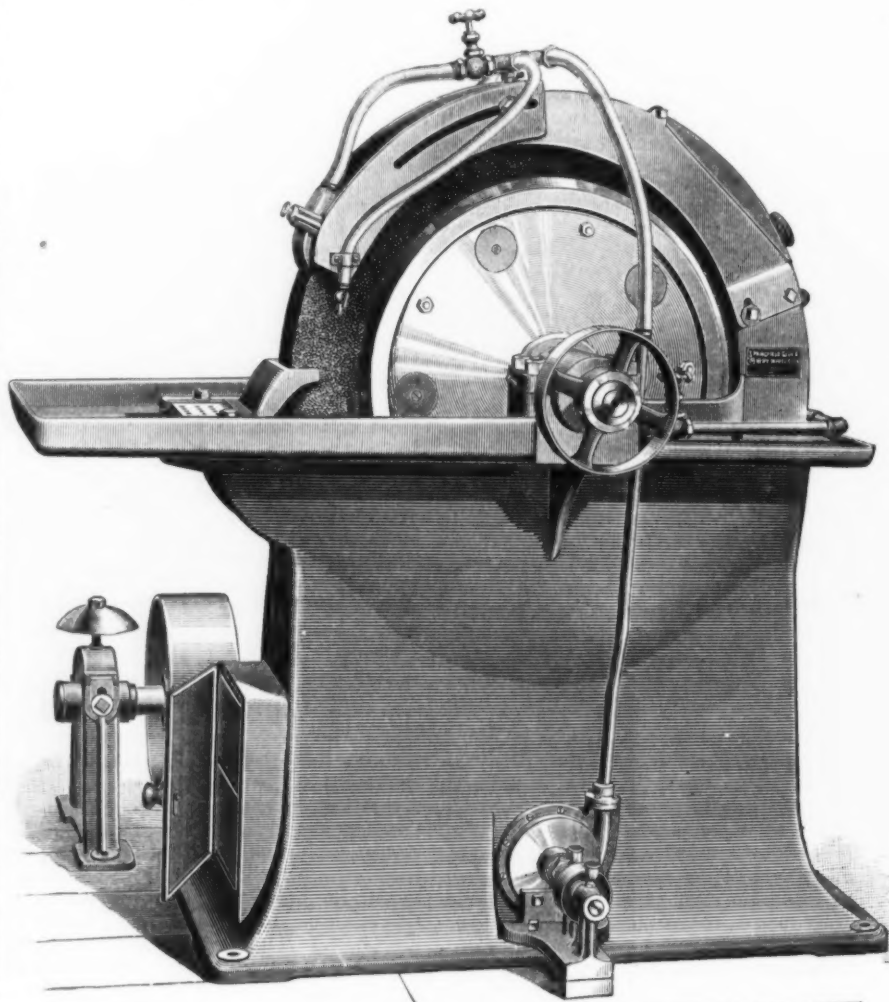
site electrode being formed of rods or plates of retort carbon. Articles of copper or brass become black at once, but those of iron are attacked by the bath. It is therefore necessary to nickel the latter. In order to preserve the deposit of iron the surface must be lacquered."

Improved Emery Wheel Tool Grinder.

An improved form of emery wheel tool grinder is at present being turned out by the Springfield Glue and Emery Wheel Company, of Springfield, Mass. As shown in the cut on this page, it is a very heavy machine, weighing over 2200 pounds, and the base

sight (except when the doors are open). Having the pump connected to only the lower tank leaves the upper tank free from pipe connections, so that it can be quickly emptied.

The table has sufficient pitch from all sides toward the wheel to prevent the water standing on the machine. It has self-oiling bearings 8 inches long, a 24-inch steel spindle and carries an emery wheel 36 inches in diameter and 4 inches thick, with a 24-inch hole. The wheel is held by large collars. Owing to the large hole there is no wheel-hub or center to throw away, making a large saving in the cost of future wheels. The collars are arranged so that the wheel can be quickly



IMPROVED EMERY WHEEL TOOL GRINDER, BUILT BY THE SPRINGFIELD GLUE & EMERY WHEEL CO., SPRINGFIELD, MASS.

has sufficient flare to give it a very solid floor foundation, which prevents vibration when being used.

An iron tank, easily reached, is placed inside of the base under the wheel to receive the water coming from it and catches the waste ground off, which quickly settles to the bottom. When sufficient collects the tank can easily be drawn out and emptied. The water overflows from this tank by means of a syphon, which takes the water enough below the surface to prevent its collecting any oil or scum, and, conducting it into a second tank directly underneath, to which a centrifugal pump is attached, arranged to carry water to the wheel, where valves regulate the flow to any desired amount. The water flows onto the wheel through a small opening on the under side of the water spreader, which is made of brass, giving an even sheet of water across the width of the wheel. The tanks, being inside of the base, are out of

balanced. There is a hinge door on the back side of the hood, easily arranged, so that long, heavy tools can be ground on that side in good shape, the water coming on just below this opening to prevent any heating of the work. The machine stands 36 inches high from floor to center of spindle, and covers a floor space of 24 x 48 inches.

John Baird, of Philadelphia, was chosen president of the board of trustees to carry into effect the will of the aged philanthropist, Isaiah V. Williamson, for the proposed Free School of Mechanical Trades, and a site will soon be selected.

The Finance Committee of the Philadelphia Councils recommend the expenditure of \$3,700,000 for permanent improvements the coming year, in addition to the regular appropriations. The largest item is for a reservoir.

THE WEEK.

The Chamber of Commerce of New Orleans and the Produce Exchange have declared in favor of consolidation and the organization of a strong Board of Trade that will be able to work more successfully than the present commercial bodies working separately.

Representative Stewart, of Georgia, introduced a bill in Congress to establish a graduated income tax, the proceeds of which are to be applied to the payment of pensions. It provides that all individuals, corporations and estates receiving an annual net income of \$5000 and upward shall be assessed in proportion to said income. Incomes from \$5000 to \$10,000 are to pay 2 per cent.; from \$10,000 to \$25,000, 3 per cent., and so on. Most people have been of the impression that the Treasury receipts were already large enough for practical purposes.

A prominent shipping-house of this city has received numerous replies to recent inquiries from this side addressed to various parties in the United Kingdom respecting the outlook for American wheat and flour in British markets. The inference is drawn that, owing to the high price of the American product, mainly due to speculation, it is not improbable that our foreign trade in cereals may continue to suffer. Besides liberal supplies of Russian wheat of a fine quality, the finest qualities of Hungarian patents can be bought considerably below Minnesota patents. Both Hungarian and North German mills have taken advantage of the situation and sold heavily. As to future supplies, London dealers profess to anticipate no important rise in prices, to meet the American level. While it is admitted that England can expect little or nothing either from India or Australia before another season, it is obvious that the United States encounter sharp competition in all the European food markets, not only as respects grain, but in provisions, dairy products and other leading staples. Furthermore, artificially "pegging up" prices by unscrupulous speculators of the "Old Hutch" pattern is calculated to make foreign purchasers more independent so long as this vicious course is continued.

Consul-General Bassett, the Haytian representative in this city, is of Spanish descent, but is a native of Connecticut, and resides with his family in New Haven because of the social and educational advantages afforded to his family there. His oldest son is a student of Yale. Mr. Bassett has represented Hayti in this country since 1879.

The old Erie building, on West street, at the junction of Duane and Reade streets, was leased to Deane & Co., bankers and warehousemen, for a term of ten years, at \$31,000 per annum. The Erie Railway Company had been paying the city, by whom it is owned, \$17,000 and taxes. It is proposed to convert the first story into butchers' stalls.

Vessels navigating the lakes are allowed a reduced premium by the marine insurance companies if they are provided with oil to lessen the dangerous effect of heavy seas. Two quarts an hour is all that is needed under ordinary circumstances, although in the case of long tows that amount could be doubled. Experience on the ocean has demonstrated that thick and heavy oils are generally the best.

The Nicaragua Canal project is again brought into prominence by a bill introduced in Congress to incorporate the Maritime Canal Company, of Nicaragua. It is thought in Washington that the bill has little chance of becoming a law. The

vested interests of the Pacific railroads and of the Panama Canal are well represented, and although there appears to be a majority of the House favorable to the measure the minority is strong enough to defeat it.

The pneumatic gun cruiser just completed for the United States Government will be able, according to Park Benjamin, to throw against an enemy, 1500 yards distant, 1800 pounds of nitro-glycerine, the explosive energy of which equals that of about 3400 pounds of dynamite, or more than ten tons of gunpowder, and this can be repeated every two minutes.

Geo. Westinghouse, of Pittsburgh, instead of bringing natural gas to the manufacturers now proposes to take the furnaces to the natural gas. With this object 600 acres have been purchased as the site for a new town, 6½ miles from Murrysville, whence Pittsburgh derives its present supplies, by means of a pipe line 22 miles in length. The new town of Turtle Creek property will be occupied by mills and factories.

A number of prominent merchants in this city in a debate before the Chamber of Commerce discussed the proposed removal of the custom house, and the weight of opinion favored the enlargement of the building now in use; and in reference to the location for the new Government buildings a resolution was adopted, after some opposition, in favor of an uptown site rather than one near the Battery.

A Constantinople dispatch says: "The Porte has signed a convention with Seligman's banking firm permitting the junction of Turco-Greek railways, English, German and French tenders for which were rejected by the Porte for political reasons." Messrs. J. & W. Seligman & Co. confirm this, but say they have as yet no details. The project, which is to build a road to the boundary line of Turkey, will involve the expenditure of about £5,000,000.

The Secretary of the Navy has appointed Captain W. T. Mahan, Commander C. M. Chester and Lieutenant-Commander C. H. Stockton a board to select a site for a navy yard on the northwest coast of the United States.

The subject of industrial education was discussed by Dr. Samuel Eliott, Dr. John G. Blake, Prof. J. D. Runkle, of the Institute of Technology, and several others at a meeting of the Boston Boot and Shoe Club, held last week, and a resolution was passed favoring the extension of the public school system of that city so as to offer advantages to those who desire to fit themselves for mechanical occupations, as well as for professional or commercial pursuits. In Pennsylvania the Commissioners of Industrial Education and the principals and trustees of the State Normal Schools had a conference in Harrisburg on the subject of manual training in the public schools, and a resolution was unanimously adopted declaring that the principals were heartily in favor of the object.

Refugees from Jacksonville, Fla., may return December 15.

The State of Nevada is losing inhabitants. The total vote in 1886 was 21,660. This year it has fallen to 12,278. The question is asked with much pertinence— "What population does that indicate in a State entitled to one Representative in Congress, and to equal representation with New York, Pennsylvania or Ohio in the Senate of the United States?"

The Interoceanic Railway, the only line in Honduras, extends from Puerto Cortez, the chief port on the Atlantic Coast of the republic, to San Pedro, a distance of 37 miles. As it controls the bulk of Ameri-

can trade with Honduras, an effort is making in New Orleans to put it in good working order under a Government lease to General Kraft for 26 years.

The American Federation of Labor, which met in annual convention at St. Louis, on Tuesday, is now the largest and most powerful labor organization in the United States. It has a membership of 650,000, which is still increasing. The Knights of Labor have but 200,000, and, from present reports of the recent withdrawal of the miners and others it is growing less.

The effects of the Sugar Trust are shown definitely in figures. The prices of the two leading grades of raw sugar and of three grades of refined sugar on October 1, 1887, a few days before the trust was completed, and on October 1, 1888, one year later, are as follows:

	Oct. 1, 1887.	Oct. 1, 1888.	Advance.
Fair refining.....	47½	51½	4
Centrifugal.....	5 7-16	6½	1 1-16
Cut loaf and crushed 6½	8½	9	½
Granulated.....	6	7¼	1¼
Coffee A, standard..	5½	7½	2

It will be seen that the price of cut loaf and crushed sugars was 2 cents a pound higher on October 1, 1888, than it was one year earlier, and that the advance for the other grades had been 1½ cents.

A short outlet for coal from the Clearfield region to Eastern New York and all of the New England States will be provided by a railroad now building between Binghamton and Williamsport. Large quantities of coal are being moved at Bernice at a low cost. The new road also penetrates a tract of country heavily timbered.

A contract has been executed between the Hudson Suspension Bridge and New England Railway Company and the Lehigh and Hudson River Railway Company, by which the latter is to send over the Hudson Suspension Bridge, now being constructed from Anthony's Nose to Fort Clinton, all freight, passengers and mail and express matter and other railroad traffic and business originating west of the Hudson River and destined to points on the east which the Lehigh and Hudson River Railway Company may be able to control, and which can be practically and profitably carried by that route. The contract covers a period of 50 years.

The stockholders of the Shipowners' Dry Dock, at Cleveland, have raised their capital stock to \$200,000, for the purpose of establishing a shipbuilding plant.

A monster 200-ton gun, to carry a projectile weighing 2 tons, is being made at the Woolwich arsenal for coast defense. It is expected to prove effective within a distance of 15 miles.

Joseph Out, whose name has been prominent in the coppersmithing business of Philadelphia for many years, died in that city last week, aged nearly 93 years.

In the case of Brown & Bros. against Wm. H. Brown and the executors of the estate of Philo Brown, Judge Fenn, of the Superior Court, in Waterbury, Conn., holds that the plaintiff shall receive \$125,000, the amount of a note given by Philo Brown for money and assets of Brown & Bros. loaned to Wm. H. Brown when he was manager of the New York Star.

The annual report of the Chief of Treasury special agents on the operations of the Immediate Transportation service says that during the past fiscal year 1,738,653 packages of merchandise, of the invoice value of \$38,929,000, and estimated duty of \$21,218,538, were forwarded without appraisement under this system. Of \$38,929,000 of merchandise handled, \$25,012,000 was imported at New York, \$3,751,-

000 at San Francisco, \$2,777,000 at Baltimore, \$2,679,000 at New Orleans, \$2,481,000 at Philadelphia, \$585,000 at Port Townsend, and smaller amounts at the eight other ports named. Of this aggregate, \$11,496,000 was finally delivered at Chicago, \$5,029,000 at Philadelphia, \$4,182,000 at San Francisco, \$3,205,000 at St. Louis, \$2,614,000 at Cincinnati, \$2,515,000 at New York, \$1,912,000 at Boston, and smaller amounts at the other ports mentioned in the list.

The chief of the alleged Burlington dynamite conspirators, John H. Bauers, was on trial at Geneva, Ill., last week, and John A. Bowles, the most important witness, testified that on a number of occasions he had been hired by the defendant and received various sums of money with which explosives were purchased and used in the destruction of rail tracks and other property.

Cotton mills in New England are enjoying a period of exceptional prosperity. The annual statements of several Fall River concerns are significant. During the past year the Wampanoag Mills have earned \$157,000 on \$750,000 capital, and have paid \$86,350 in dividends. The Union Cotton Company earned \$237,000 and divided \$187,500 on \$750,000 capital. The Granite Mills cleared \$136,000 and distributed \$64,600 on \$400,000 capital. The Sagamore Company, capitalized at \$600,000, earned \$133,000 and divided \$78,000. The balance between the earnings and dividends, save what is carried to surplus, represents allowance for depreciation of plant, improvements, &c. The Amoskeag Company, the great Manchester concern, which, on the whole, is probably the most profitable corporation in New England, has cleared \$425,000 this year, out of which it has paid 25 per cent. dividends, leaving over 4 per cent. in addition for surplus.

The United States dynamite cruiser *Vesuvius* made her first trial trip this week and succeeded in making a speed of over 21 miles an hour, 1 mile and more faster than required by the contract with the Government.

Discouraging accounts are received from Central and Western Kansas, caused by the abandonment of farms in consequence of losses of crops and cattle from the protracted drought of last summer. A letter from Salina, Kan., says: "As a whole, Central and Western Kansas did not this year make one-fourth of a corn crop. All through the desolate, scorched region wheat made a fair crop and the grain fetched a remunerative price, but there was not sufficient quantity of that grain raised to tide the farmers over their financial embarrassments. Bankruptcy stalked over the plains of Western Kansas and struck down hundreds of farmers. The financially ruined agricultural people who till arid-zone land have very generally decided to fight no longer against nature. It is estimated that at least 5000 mortgaged farms in Central and Western Kansas have already been abandoned, and the exodus has been commenced. It is not a mortgaged farm here and another yonder, as it is in New York, but almost all farms are mortgaged. In the western counties of Kansas the mortgages are of small face value, but in the 'Golden Belt' region of Central Kansas as high as \$3000 has been frequently loaned on 160 acres of agricultural land. But when a farmer tills incumbered land with incumbered tools that are drawn by mortgaged teams, and a fiery wind burns up two consecutive corn crops, it is evident that he cannot pay interest money—it matters not the size of his mortgage—pay taxes, and live."

The report and findings of Referee John A. Shields in the suit of the Webster Loom Company against Elias S. Higgins & Co.,

the carpet manufacturers, involving the patent-right of the wire motion weaving machines, was made to the United States Circuit Court in this city on the 6th inst. The defendants placed the invention on 61 of their looms in 1873, and after manufacturing 82,000,000 yards of carpet the Webster Loom Company secured an injunction and put in a claim for royalties. The Webster Loom Company claimed \$2,631,575.64 damages, and expert testimony without end has been produced. The report of the referee just made was again in favor of the defendants. "I am forced to find and report," said the referee, "that the complainant has failed to establish by trustworthy legal proof any basis upon which the gains, profits or advantages realized by the defendants by reason of the infringement complained of can be computed."

Representative Butler proposes that Congress shall appropriate \$1,000,000 for a 60-inch telescope. The largest instrument in the world, in Lick Observatory, has a glass 36 inches in diameter, but the Tennessee man will be satisfied with nothing less than 5 feet. With reference to this proposition, Alvan Clark, the renowned maker of lenses, says that he does not believe any better results can be obtained by constructing so large a glass—that is, provided it is located on the Atlantic slope. As to the possibility of constructing such an immense lens, Mr. Clark will only say that it can be done if the glass can be cast, but such a thing was never before dreamed of.

The largest coal dock in America will be built at once at West Superior by the Eastern Railway Company. It will be 2000 feet deep and 800 feet wide, with a central vessel slip 2000 feet long and 100 feet wide, giving 8700 feet of dock frontage for unloading. Car tracks will run all through the structure, which will have a storage capacity of 1,500,000 tons of coal.

Cleveland, Ohio, seeks coal direct from Martin's Ferry, W. Va., and local capitalists are about to extend the Cleveland and Canton Railroad to form a part of the South Pennsylvania and Ohio scheme.

A contract was closed on Saturday with the East End Electric Light Company, a Westinghouse concern, to illuminate the entire city of Pittsburgh. To do this it will require 2000 400-candle-power arcs and 2800 25-candle-power incandescent lights, at a cost of \$120,000 per annum.

Forty large English steamships, the *Philadelphia Record* says, have within the past week been chartered to bring iron ore from various Mediterranean ports to that port. These steamships, which are of that class of sea rovers known as ocean tramps, have a tonnage capacity of 55,000 tons and carrying capacity of 75,000 tons.

Consul Loening, of Bremen, in a report on the commerce of that port, shows that the value of the imports from the United States has increased from \$22,083,250 in 1871 to \$42,881,312 in 1887, and the exports to the United States increased from \$16,607,188 in 1871 to \$20,058,175 in 1887. The imports from the United States are more than four times as great as from Great Britain or from Central and South America combined, while the exports to the United States are four times as great as to Great Britain and more than nine times as great as to Central and South America combined. The importance of Bremen as a cotton port appears from the fact that she imported from the United States in 1887 cotton to the value of \$29,610,500, an increase of more than \$10,000,000 over 1886. Out of 2879 vessels, with a total of 1,444,683 tons, only one vessel of 1270 tons carried the American flag.

MANUFACTURING.

Iron and Steel.

The citizens of Jefferson, Tex., have donated property to secure the building by John Kruse, of Chicago, of a blast furnace.

Under date of the 6th inst. S. McClure, agent of the Stewart Iron Company, Limited, at Sharon, Pa., writes us as follows: "Our No. 1 stack was put in operation on Monday last. We now have our two blast furnaces running, and 13 puddling furnaces in our mill running single turn of five heats per turn—product, blooms, muck bar and billets—the same being used for making open-hearth and crucible steel. All the iron works in the Shenango Valley, with the exception of the Wheatland Mill, are in operation."

The Bessemer department of the plant of the Columbia Iron and Steel Company, at Uniontown, Pa., will be put on double turn as soon as the necessary arrangements can be made. The other departments have been running night and day for some time past.

James P. Witherow, engineer and contractor, of Pittsburgh, is bidding on seven new iron and steel plants to be erected in the South during the next year, with good prospects of securing them. Mr. Witherow states that the next year promises to be the biggest year in the erection of iron and steel works this country has ever seen. These seven contracts will in the aggregate amount to over \$1,000,000, and are to a large extent being erected by Northern capital. The extensions now being made at the works of Mr. Witherow, located at New Castle, Pa., are almost completed, and will increase the capacity of the works about one-third. They will then give employment to some 200 new men, making a total of about 600 men employed. The firm have already work on hand that will keep them busy for the next three months.

A rumor was published in the Pittsburgh papers last week to the effect that a wholesale discharge of employees had taken place at the works of the Edgar Thomson Steel Company, at Braddock, Pa. Upon investigation we find that there is little truth in the rumor. About 40 men have been discharged, the majority of them being metal-handlers. The reason given for the discharge of these men is that navigation has closed, and, consequently, their services were not required.

A rumor is published that the old Wampum Furnace, at Wampum, Pa., which has been out of blast for some years, has been purchased by some capitalists of Pittsburgh and the Shenango Valley, and will be rebuilt throughout and again put in blast. Among the advantages set forth are the excellent railroad facilities and the fact that native ore and limestone can be procured in the vicinity of the furnace. It was erected in 1856, and has already been partially dismantled.

The officers of the Pottstown Iron Company, at Pottstown, whose nail factory has been lying idle during the past two or three weeks, have requested the nailers to accept a reduction of 25 per cent. The feeders are already working at bottom figures. At a conference of the employees held on the 7th inst., the men gave the company to understand that they would prefer a reduction of working hours instead of a reduction in wages as contemplated, if the company found it necessary to make a change after January 1.

The Findlay Rolling Mill Company, of Findlay, Ohio, are operating their new chain works in all departments, and are working thirty-four fires on coil and cable

chains, $\frac{1}{2}$ to 2 inches. This firm some time ago purchased the plant of the Stirling Chain Company at Cuyahoga Falls, Ohio, and removed it to Findlay.

Chester Furnace, at Chester, Pa., operated by the Chester Rolling Mills, which has been idle since March last, resumed operations last week. It has a capacity of about 125 tons per day.

Plans and specifications have been drawn up by Carnegie Brothers & Co., Limited, proprietors of the Edgar Thomson Steel Works, at Braddock, Pa., for the erection of a foundry and machine shop at Braddock. The intention of the firm in putting up this structure is to make all their own castings for the blast furnaces, &c., which work they have always been obliged to get done by outside firms. A 15-foot boring mill has been ordered for the machine shop.

Oley Furnace, at Sempie, Pa., owned by the Clymer Iron Company, which has been idle for some years, is being dismantled. It is one of the oldest furnaces in the country, having been erected in 1772.

North Penn Furnace, of the Bethlehem Iron Company, at Bingen, Pa., was blown out last week and will remain idle for an indefinite period. The limestone quarries in that vicinity have also ceased operations.

When the large blast furnace of the Etna Iron Works, Limited, at Ironton, Ohio, was erected in 1872 only one of the twin stacks was completed. The Alice stack was finished, but Blanche was left unlined and incomplete. Blanche has recently been relined and was blown in last week. The work of lining has been going on for months. It has cost about \$23,000, including all necessary changes and additions, and over 400,000 brick, including red and fire brick, have been used. Meanwhile Alice has been blown out and the engines and Whitwell ovens used for that furnace have been connected with Blanche. It is probable that the Alice stack will be blown in again after the first of the new year. Sarah furnace, also owned and operated by the above-named company, has been blown out and will be relined and repaired at once, with a view of blowing in again about the first of the year.

Thus far about 125 employees of the pipe mill of the Reading Iron Works, at Reading, Pa., have been discharged, and it is said that others will follow.

The Keystone Rolling Mill Company, of Pittsburgh, are erecting two new puddling furnaces at their plant on Second avenue in that city.

Etna Furnace, of the Etna Iron Works, Limited, at Newcastle, Pa., has broken twice recently her best previous record. In 24 hours her output in the two turns included in that time was respectively 85 and 83 tons, making a total in the 24 hours of 168 tons. The furnace surpassed even this record subsequently. In 24 hours the furnace produced 170 tons of iron. These records are more remarkable from the fact that the Etna has but two engines and two hot-blast stoves. The furnace, when the above was accomplished, used soft Lake ores.

The new blast furnace of Laughlins & Co., of Pittsburgh, now in course of erection, will be one of the largest blast furnaces in Allegheny County. It will be 22 feet bosh and 80 feet high. There will be four hot-blast stoves 21 feet in diameter and 80 feet high. The foundation for the furnace is finished and the ironwork is being put up. The ironwork for the stoves is nearly finished. The engine-house, stockhouse and boiler-house are all in course of construction. It is expected that the entire plant will be completed by May 1, 1889. The furnace is the same

size as Furnace F, at the Edgar Thomson works, which is the largest, and which has broken the world's record. Riter & Conley are the contractors and engineers of the ironwork, and W. G. Wilkins is the engineer in charge of construction of foundation and buildings.

Lynchburg Furnace, at Lynchburg, Va., which has been undergoing repairs for the past five months, has resumed operations. The repairs which have been made to the furnace are extensive, and consist of entire new fire-brick, from hearth to hopper, new bosh and crucible jackets, new bell and hopper, new sheet-iron roofs. All the machinery, boilers and pumps were overhauled, and new trestles and floors were made to the stackhouse. The capacity of the stack has been increased to 50 tons per day. The furnace and plant, which belong to the Lynchburg Iron Company, have been leased for a term of years by J. Risque Hutter, who will have immediate charge of the business.

The Terre Haute Iron and Nail Works will, in all probability, soon abandon the manufacture of nails, the owners of the works having had a sufficient experience in that line. They have some material on hand to work up, which will keep the factory running for some little time. The fate of the plant has not yet been decided, but a portion of the rolling mill may be adapted to other uses, now under consideration by neighboring manufacturers. The owners, it is understood, will entertain proposals from parties desiring to engage in any branch of manufacture for which the remainder of the works may be found suitable.

The new furnace at Trussville, Ala., is practically completed. It will go in blast in January. It has been erected by Pennsylvania men of life-long experience in iron and coke making, and is one of the best built coke furnaces in Alabama. Its blowing, heating and boiler power is much greater than actually required, giving ample reserve in case of need. It will make 100 tons per day.

The second stack of the Woodward furnace plant in Alabama has gone into blast, and both furnaces are now running successfully, making an average of 200 tons per day. The Woodward has been one of the most successful of all the Southern iron-making enterprises, owing to able and energetic management.

The new furnace of the Gadsden Alabama Furnace Company, making the Etowah brand of coke iron, has got up to 120 tons per day. It is handled by the widely-known founder, John Dowling, formerly of Rising Fawn Furnace. The iron is very tough and dark, resembling charcoal iron. It is rumored that L. S. Colyar, president of the company, will retire in December.

There is a large charcoal furnace under construction at Attalla, Ala., which is built to make high grade Alabama car-wheel iron, like Woodstock and Shelby. It is near Anniston, and will use the same class of ores as the well-known Woodstock. The aim will be to make chilling grades only. It will be completed by February 1.

Nearly all of the leading Alabama coke furnaces have very decidedly improved the character of their iron in the past year or two. Some of the iron now being made by Sloss, Woodward, Mary Pratt, and Etowah will rank with the best produced in the country for color, toughness and high grading.

The Chicago Crucible Steel Casting Company have been delayed and disappointed with their new furnaces and gas-producers at their works, located on Elston and Webster avenues, in Chicago. They

had already put in eight crucible steel furnaces and one open-hearth furnace, with five gas-producers, of a construction strongly recommended to them; but the system turned out to be a total failure for melting steel, and caused great loss and delay to the company, as well as to their numerous customers. The company have now pulled down these furnaces and entrusted Lean & Blair, of Pittsburgh, with the contract for new Siemens furnaces of the most approved and well-tried construction. This firm have gone very energetically to work, and will have the first five sets of crucible furnaces and the large drying ovens, together with Siemens producers for the same, ready for use by the 15th of this month, to be followed by a large 48-pot furnace and a 10-ton open-hearth furnace of the Lash pattern. The customers of the Chicago Crucible Steel Casting Company will, therefore, be able to get their castings during the last half of the month of December, as the company will work their furnaces night and day to catch up with some of their orders.

The Central Iron and Steel Company, of Brazil, Ind., have added a department to their works for the manufacture of turn-buckles used by bridge builders and others. The new department consists of a train of rolls, with the necessary heating furnaces, four presses, a special machine, with six spindles to tap the buckles right and left, a large bolt cutter, lathes, &c. It is housed in a neat ironclad building, erected for the purpose, and is under the special management of Mr. Williams, formerly with the Cleveland Forge Company. A feature in the work introduced by him is the manufacture of the buckles in two pieces instead of four, which has hitherto been customary.

Isabella Furnace No. 1, of the Isabella Furnace Company, at Etna, Pa., near Pittsburgh, is 18 feet bosh, 75 feet high, 11 feet hearth, and 14 feet at the top. This furnace has made the following number of tons of Bessemer pig iron for the weeks ending as noted below:

	Tons.		Tons.
October 6.....	1,655	November 10....	1,503
" 13.....	1,564	" 17.....	1,798
" 20.....	1,685	" 24.....	1,778
" 27.....	1,665	December 1.....	1,522
November 3.....	1,698	" 8.....	1,766

This is a total of 16,634 tons in ten weeks, or an average of 1663 tons per week. It is certainly a very creditable record.

The Philadelphia and Reading Railroad Company have purchased the property of the Allentown Iron Company, at Allentown, on which will be located the terminal, which the company will build as a connection between the East Penn and Jersey Central roads through Allentown. The property purchased contains three blast furnaces, two of which are in operation. As soon as the transfer was made George F. Baer, of Reading, a Philadelphia and Reading director, was elected president, and Albert Broden was chosen general manager of the Allentown Iron Company.

At a recent meeting of the stockholders of the Decatur Land Improvement Company, of Decatur, Ala., Mr. C. C. Harris was elected president of the company, to succeed Major E. C. Gordon, who recently resigned.

On the night of the 28th ult. the explosion of a lamp in the engine-room of the nail factory of the Duncannon Iron Company, at Duncannon, Pa., caused a fire which totally destroyed the factory and its contents, including 64 nail machines. The blast furnace, rolling mill, foundry, nail warehouse, &c., were not injured. The loss is estimated at over \$30,000, about covered by insurance. The factory was an old wooden building, and

the company expect to replace it with a fire-proof structure with all the newest appliances for nail manufacture.

Machinery.

The Montreal Rolling Mills Company, Montreal, have decided to enlarge and improve their mills. S. T. Williams & Co., Philadelphia, being appointed contracting and consulting engineers.

The New York Belting and Packing Company, manufacturers of rubber belting, packing and hose, have recently opened a branch house in San Francisco, Cal., which will be under the control of Messrs. Arnett & Rivers and located at 17 and 19 Main street, that city.

A press dispatch from Susquehanna, Pa., under date of the 7th inst, reads as follows: "The New York, Lake Erie and Western Railroad Company having decided to have the work performed in Buffalo and elsewhere by outside contractors, the extensive foundry and steam hammer department of their shops here will be closed. About 200 men are employed."

The Ohio Brass Company, of Mansfield, Ohio, have been incorporated; capital, \$25,000.

The Main Belting Company, of Philadelphia, are running very full on their cotton belting, for which they have a steadily increasing demand. The electric light companies are using these belts very largely and with entire satisfaction, judging from the number of commendatory letters which they are receiving.

Byram & Co., of Detroit, Mich., exclusive manufacturers of the Colliau cupola furnace, have recently placed four of their large-sized Colliau cupolas in the new shops of the United States Rolling Stock Company, Anniston, Ala., and besides other orders have a contract with the C. A. Treat Car-Wheel Works, now locating plant at East Chicago, for two large size Colliau cupolas.

Among the recent sales of the Sioux City Foundry and Machine Works, Sioux City, Iowa, are two of their 75-horse-power Corliss engines, for the Pioneer Press building at St. Paul, Minn.; also two 75-horse-power Corliss engines, sold for electric-lighting purposes, one going to James Bell, David City, Neb., and the other to the Storm Lake Electric Lighting Company, at Storm Lake, Iowa. The first of the new line of sizes, a 10 x 16, of Giddings' single valve automatic engines, also built by the works, was sold some time since, together with a boiler, to go to the Chillicothe Water, Gas and Electric Light Company, Chillicothe, Mo. They have also a large force of pattern makers at work, bringing out a full line of sizes of this engine, which is known in the East as the Russell Automatic. In addition to this, the works have recently sold several large boiler plants, together with a number of combined outfits, for the Erie Engine Works, manufactured by Cleveland & Hardwick, of Erie, Pa., for whom they are Western agents. They are busy improving their works, and are putting in at present a 90-inch fly-wheel lathe, also an overhead traveling crane, 30-foot span and 7 tons capacity. Their foundry department is driven to its utmost capacity, being obliged to work evenings in order to get out steam engine-work, in addition to a large amount of architectural ironwork.

President Acheson and Secretary Painter, of the Tubular Wheel Mfg. Company, have been at McKeesport, Pa., to look into the question of locating at Bissell, near McKeesport.

The Hussey Re-Heater and Steam Plant-Improvement Company, of No. 15 Cortlandt street, New York, have just issued a

number of circulars and catalogues setting forth the advantages of their system of reheating exhaust steam and superheating live steam. A number of engravings are given, showing the details of their reheater and its application to existing plants, the whole forming a very interesting exposition of the subject.

The Hughes Steam Pump Company, of Cleveland, Ohio, have sent us a copy of their new catalogue, which will be known as No. 9, and is dated 1889. It is devoted to their various lines of steam pumps and gives illustrations, price lists, tables of dimensions and brief descriptions. In addition, short chapters are given containing directions for connecting and running pumps, miscellaneous paragraphs of general interest relating to pumping work, tables of areas of circles, loss of fluid pressure by friction, with different diameters of pipe nozzles, &c.

Messrs. Thos. Carlin's Sons, of Allegheny, Pa., have sent us a copy of their catalogue devoted to stationary, hoisting and winding engines, pile-driving machinery, boilers of various types, centrifugal pumps, grinding pans, &c. The catalogue is profusely illustrated, and the different designs are briefly described. Tables of sizes are also given.

The Chesapeake and Ohio Railroad is about to erect extensive shops and a round-house at Gladstone, near Lynchburg, Va., on the line of the Richmond and Alleghany Railroad. Employment will be given to about 500 men.

Among recent orders billed by the Revere Rubber Company, of Pittsburgh, may be mentioned a belt for the Westmoreland Paper Company, at West Newton, Pa., which was 48 inches wide, tenply thick, 110 feet long and weighed 1709 pounds. It is to be used for transmitting 750 horse-power.

The Montana Coal and Coke Company, on the Morgantown branch of the Baltimore and Ohio railroad, are erecting a new crusher and washer that is to cost \$40,000. The company have fired their full plant, consisting of 169 ovens. About 200 men are employed. It is said that a company has purchased 10,000 acres of coal land on the West Fork River, near the New England mine, and will at once commence the construction of 200 coke ovens. The company will also build a railroad from Fairmont to Clarksburg to intercept the Baltimore and Ohio at that place.

F. R. Phillips, 407 Walnut street, Philadelphia, reports November sales of Post's Zero metal to be the largest on record. The continued increasing demand and large repetition orders are pointed to as sufficient evidence of its quality for heavy pressure and high speed machinery.

The Columbian Iron Works and Dry Dock Company have under construction an iron frame, iron plated, side-wheel steamer, which is to be used as a harbor iceboat. Her dimensions are 210 feet in length, 34 feet beam and 14 feet depth of hold; she will have horizontal engine of 1200 horse-power, jet condenser, and large double end boiler to carry 60 pounds. The prow of the boat is so formed that, when breaking ice—which will be its principal occupation—the boat will ride upon and, by its weight, crush the ice. The cost will devolve jointly on the city and State.

Hardware.

The Universal Horseshoe Machine Company have erected their plant at Anniston, Ala., within a few rods of the bloomery between the tracks of the Georgia Pacific and the Atlanta and Anniston railroads. The building is 150 by nearly 100 feet. Anniston was selected that the company might use the blooms made by the bloom-

ery, which are referred to as especially adapted for horse and mule shoe purposes. The company intend making six different kinds and sizes of horseshoes and two different kinds and styles of mule shoes, which will possess features entirely different from any heretofore in use. The three-calked and four-calked are especially alluded to. These calked shoes are made by a machine lately patented, by which they are turned out at a rapid rate. In regard to the special features of these shoes the company advise us:

The calks are left in the bar and spaces of the material are rolled out between these calks. The rolls of the machine receive this bar of the required size as it comes from the train hot, and, passing through these grooved rolls to the necessary length, it is then cut off and bent into the horse or mule shoe shape. A clip is then put upon the toe of the shoe, and, after the nail-holes are punched, the shoe is complete, ready to nail on. The company are called Universal because they intend, and can make by this machine, any kind or style of horse or mule shoe required or designed, with or without calks or a continuous calk, or a plain flat shoe, or a shoe partly calked and other parts swedged up, &c.

It is the intention of the company to make from 15 to 25 tons of shoes per day. The 12-inch merchant train, together with engine and rolls, are being made by the Lewis Foundry and Machine Company, of Pittsburgh, Pa., and the horseshoe machines by the Delamater Iron Works, New York. The company have a capital of \$300,000, and, with their improved machinery, expect to furnish these different varieties of horse and mule shoes, made complete, at a lower price than the shoes now in use are put on the market. The present officers of the company are J. D. Billings, president; T. B. Everett, treasurer, and C. L. Suffern, secretary.

The Buhl Stamping Company, Detroit, Mich., are at present manufacturing brass and japanned bird cages, cheese factory can trimmings, railroad shipping can trimmings and the Buhl safety lock tubular lanterns.

We are informed that the report that the Leng Wire Nail Company, of Belleville, Ill., would shortly increase the number of nail machines in their factory and also increase their capital stock is without foundation. The company at present are operating 14 machines.

E. C. Atkinson & Co., saw manufacturers, of Indianapolis, Ind., are about to place upon the market the largest saw, as they claim, ever made in this country. It is to be 88 inches in diameter and No. 12 gauge, the rim being about 8 inches in diameter; will admit sawing 40-inch lumber without the necessity of double saws. During the past year this company have invested about \$50,000 in a plant for the manufacture of band saws.

The Tubular Wagon-Wheel Mfg. Company, recently chartered at Pittsburgh, with a capital stock of \$200,000, are seeking a location for a factory in the vicinity of McKeesport, Pa. No definite arrangements have yet been made as to the new plant.

The factory of the Mallory & Wheeler Company, lock manufacturers, New Haven, Conn., after a shut down of two weeks, has resumed operations. The factory will run three days a week until further notice.

The Canadian Government has granted the Canadian Pacific Railway Company the power to bridge the St. Lawrence River at Coteau. This will complete a thorough line to Boston and New York from Ottawa. The total length of the bridge, including abutments, will be 405 feet. The Central Missouri Railroad will commence work on its bridge at Alton in January.

The Iron Age

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JOHN S. KING, - - - BUSINESS MANAGER.

The Beam Combination.

Some very erroneous statements have been allowed to go unchallenged in the recent debate in the Senate on the duty on iron and steel beams, by both friend and foe. The most serious of these errors is that the producing capacity of this country has been insufficient to meet the largely increased demand; that as a result thereof beam manufacturers are indifferent sellers; that, in fact, they were unwilling to enlarge their production, preferring to manufacture a limited supply at an enormous profit. As a matter of fact, the producing capacity of the country has steadily increased. During the past few years the Homestead Mill has developed a very large output; Jones & Laughlins entered the ranks, both of them for a time remaining outside of the combination. At this writing the new Columbia mill is underselling the combination, and the North Chicago Rolling Mill Company have been gradually working their way into the beam business. At least two Eastern mills, long in the trade, are contemplating, or have under way, the erection of additional machinery. We need only add that two mills alone have been actually producing 40 per cent. of the entire quantity of beams made in the country, mills which are by no means much greater than the other six in the combination. The charge that an artificial scarcity is fostered for the sake of wringing extortionate profits from consumers is therefore absurd. It is not denied that the manufacture of beams has been fairly profitable. It has been the one branch of the trade in which brief seasons of exceptional prosperity have not been followed by protracted periods of depression and ruin. Prices have been uniform for long spaces of time. They have been sufficiently remunerative to encourage American manufacturers to be progressive far beyond anything which their European rivals have attempted. In finish, excellence of workmanship and high quality of material American beams, with a few rare exceptions, have led the world. The standard of quality has been so high that prudent builders and bridge engineers have given very little encouragement to importers, although the prices of foreign beams have been generally \$10 to \$12 per net ton lower. In structures upon the integrity of which the lives of many people are dependent absolute safety is purchased cheaply at the price demanded by manufacturers of a good article. American beam-makers can look back with pride upon their record in this respect. They have deserved the prosperity they have enjoyed, and can face the public with confidence. They have kept abreast in progress, and are leading in the important changes which are going on in the direction of substituting steel for iron. On

the whole, it has been done conservatively, without the dangers which would have accompanied wild competition.

In 1876 beams were selling at 6½ cents to 7 cents, according to size, and ¼ cent was charged for punching holes. To-day the price is about one-half, 3.3 cents per pound, with ⅓ cent added for punching. The lowest price which they ever reached was 2½ cents per pound, during one of the periods of the disruption of the combination, which have occurred at frequent intervals. In fact, the present association is the one which has enjoyed the longest life, having been formed in 1885, and even it was critically near a break at one time. The price, too, is only apparently high, as any one connected with the iron trade will appreciate when we state that it abolishes size extras entirely, and that it means free delivery. The combination price is the same for all sizes of beams, large or small. In every other department of the manufactured iron trade certain standard sizes constitute the base price, and extras are charged for odd or unusual sizes, difficult to roll, or called for only in small quantities. These extras often double the base price. The price of beams is placed to represent the average, so that in reality the purchaser of extra sizes is getting very much the better of his bargain. The expediency of such a system may be a matter for considerable discussion, into which we do not propose to enter now, but we do insist upon pointing out the fact that it gives the average price an appearance of an unduly high level. Then, the highest combination price is 3.3¢ to 3.4¢, delivered at any point east of the Mississippi River. This, again, causes it to seem high, when in reality, the mills net considerably less, the freight in some cases being as high as ½ cent a pound.

There is another charge against which a protest should be entered. A good many in the iron trade, and a far greater number outside of it, have the most exaggerated notions concerning the profits in beam manufacture. It has tempted a few into the business, who have dearly bought the experience that the rolling of beams cannot be learned in a day, that it involves large amounts of capital to carry stock, that the labor accounts are heavy and that the waste, through cutting to lengths required, is very large. It has become a favorite argument of those who are catching at popular favor by crying down the beam combination to draw parallels between steel rail making and beam manufacture. With a fine show of liberality, they generally add a few dollars a ton to a mythical estimate of cost of rails and proceed to figure out the exorbitant profits of the beam monopolist. We need only state in reply to these arguments that the same train of rolls will turn out, with the same number of men, at least five times the tonnage on rails of standard section, which it can produce of beams of average size, taking the orders for the latter as they come.

We are convinced that unbridled competition in the manufacture of beams would be a public misfortune, since it could only too quickly tend to introduce that element of false economy in the choice of raw materials and in the methods of manufacture which follows a wild struggle for existence.

Prison Convict Labor.

Mischievous labor agitators, through the operation of what is known as "the Yates law," passed by the Legislature of New York at their instigation about four months ago, have utterly paralyzed the prison labor system of this State. This law supersedes both the "contract" and "State account" systems, throwing into disuse a valuable and expensive plant of special machinery, and at the same time restricting the sale of the products of prison labor simply to the supply of the needs of public institutions. Thus 6000 convicts are plunged into idleness, with the most pernicious effects, physically and morally, and burdening the taxpayer as never before. Instead of yielding a net revenue, the costs to the State are not less than \$400,000 for the current year and for the year to come, according to intelligent estimates, these figures will be increased to \$1,000,000. All eyes are turned to the Legislature in hopes of relief. It is well understood that the State account plan was abolished and the Yates bill passed because labor organizations complained that prison-made goods competed with honest labor and wages were affected. By the use of machinery large quantities of manufactured goods were crowded on the market. In Sing Sing Prison, for example, 433 men were employed in the stove works, and as recently as last August were turning out 200 stoves a day. The Yates bill, however, abolished motive-power machinery, and in addition confined the labor of men to the narrow sphere of making only such articles as are required in our penal institutions. The labor of a few score of convicts now suffices, where under previous conditions thousands were profitably employed.

There are grave reasons for doubting the expediency of employing machinery to any general extent as a substitute for manual labor in prison management. On this point the testimony of Richard Vaux, ex-Mayor of Philadelphia, and for many years past president of the Board of Inspectors of the State Penitentiary for the Eastern District of Pennsylvania, is highly suggestive and worthy of serious attention. Mr. Vaux says: "Every convict should work, but he should not for prison profit, or with machinery, or for the payment of interest on the cost of it, nor interest on the cost of the prison plant, be worked with machinery to pay the debt account of prison expenses and call that punishment. He should be taught a trade and the use of tools; be hand-trained and head-trained, so that he can be self-supporting when he gets out of prison. He must be taught individually. If he has been employed with a gang of fellow convicts working steam-run machinery he gains no knowledge that will be useful to him when released. He has been taught only a small portion of manufacturing and what does that benefit him? His time has been wasted. He ought to be self-dependent when he leaves prison, for the chances are against him in seeking employment in a private factory like the one he worked for in prison, because he would have to give the State Prison for reference when he applied for work." It is claimed that there is no similar institution in the country better managed than the peniten-

tiary of Eastern Pennsylvania. The general plan there adopted stated in brief is to teach the whole mode of making anything that can be made by one person, so that the discharged convict may be qualified to obtain a subsistence through honest industry. The experience of the New York State reformatory at Elmira forcibly tends to corroborate these views. Fortunately for the usefulness of this institution, although Attorney-General Tabor decided that under the Yates bill all shops must be closed, the trade schools, at which hundreds of young men are being taught, may remain undisturbed so long as nothing is made in them to sell in the open market. In this reformatory are classes which receive instruction in machinery, blacksmithing, plumbing, &c., so that every man when released has command of a useful trade. It is now proposed to introduce into the New York Legislature at the coming session a bill recognizing some of the most valuable features of the Elmira Reformatory, with the object of converting Auburn or Sing Sing prison into a similar institution, while others, like Dannemora, are reserved for more depraved offenders, with the State account plan practically restored. As explained by Mr. Round, of the Prison Association, who is one of the committee charged with the preparation of the bill, one object is to make the prisons as nearly self-supporting as possible. "A limited number of men should be employed in each prison in the larger industries in the smallest possible ratio to those working in the same industry outside. The ratio should not exceed a certain per cent. That would reduce competition to the lowest possible point. Really there is no competition, for if the prisoners earn anything, the expense of keeping them is reduced just that much. It costs the State at least \$100 to support a criminal in idleness in jail for a year. When he is turned out without a trade and no means of support, it costs the State just \$3500 a year to keep him out of prison. That is based on the estimate of what it costs the State to take care of its criminal class. All that amount has to be raised by taxation, and if taxes are high wages are low and rent and supplies are high. Does the laboring man, who is in favor of keeping the prisoner in idleness, ever think of that? Now, if the criminal had work in prison, his cost would be practically nothing in jail, and he would become self-supporting when out, providing the trades unions let him earn his living at a trade learned in prison."

It is generally admitted that the wretched slough into which the prison system of this State is plunged by the Yates bill is intolerable. A four months' trial of the experiment is sufficient to condemn it, excepting so far as experience may demonstrate the wisdom of restricting the employment of machinery within certain prescribed limits. One thing is certain, that the common sense of the people revolts against any system that takes our convicts from profitable work and consigns them to indolence, while all productive labor of whatever kind is taxed for their support. From the standpoint of morality, stepping higher and beyond considerations that are merely pecuniary and politic, the condemnation is still more emphatic. The whole subject demands careful reconsideration at Albany.

Railroad Associations.

The interest taken by the people in the tariff discussion of the late election seems in some quarters to be almost equaled by the interest taken in the railroad problem. The difficulties of the situation have been dwelt upon in the daily papers, and various remedies suggested. There is one phase of the question, however, which has not received quite the attention it deserves, and that is the intimate commercial relationship between dull business in trade and in transportation. It is very clear that competition between railroads cannot be encouraged to the same extent as between rival business houses in any line of trade. Railroadings is a business by itself, having its own economic laws. Bankruptcy will always prevent a too disastrous rivalry in commercial affairs, but not in transportation. This is the lesson of the present railroad troubles as expounded by the managers, and, no doubt, it has been learned; but on the other hand it would be equally bad to eliminate the commercial features from transportation. Railroads can find their highest usefulness to investors and to the mercantile public when their profits follow to some degree the scale of profits in the communities which they serve. Practically this is often done unconsciously, but under the present discussion it is well to state it more dogmatically. This truth is really the underlying cause of much of our so-called "rate-cutting." Men and newspapers frequently charge all lowering of rates to the vindictiveness or foolishness of railroad managers, but this is very unjust. Managers like other business men are controlled by commercial conditions. As well might we say that all manufacturers are foolish when any article falls in price. Take the case of wheat. The Pennsylvania reduced the rate from Chicago to New York, because the short crop and high price had well nigh stopped the export traffic; that road and the steamship lines it controls could not afford to shut off the carriage of breadstuffs, and hence reduced the rate to stimulate the movement. Every retailer who reduces the price on unsaleable goods acts on the same principle. We cannot expect in so complicated a matter as transportation to be able to trace every reduction in tariffs at once to this source, and undoubtedly some railroad wars have no such excuses. But plain business reasons, such as influence merchants the world over, can be given for a larger part of tariff breaking than is generally supposed. There comes a time to every railroad manager when traffic for his road at reduced rates or no traffic at all is the alternative. In such cases there is but one wise choice. Occasionally we have men wondering why railroad rates are steady when the volume of traffic is large, but weak when tonnage is light. Here is the simple and ample explanation: the laws of trade operating to make the business of transportation no more profitable than any other business.

At the present time the stock market represents the general state of trade as well as the condition of our railroads.

These facts should be borne in mind in any attempts to remedy our railroad troubles by legislation. The Interstate Commerce Commission in their report speak of

the need of regarding our railroad system as a whole and we think the public mind is more favorable to associations between carriers for this purpose than heretofore. But it does not follow that a legalized pool is necessary for this, and in so far as such a rigid system would be out of touch with the commercial conditions of trade it would not be best for itself or for the community. An association of railroads strong enough to protect itself against combinations of shippers—the dressed-beef men, for instance—and strong enough to insure a reasonable degree of steadiness and impartiality to shippers' rates of freight, such an association is to be welcomed; but this should not include power enough to force rates upon merchants and manufacturers without regard to changing commercial conditions.

A Needed Convenience in the Machine Trade.

Builders of special machinery may be excused for not informing their clients how to order duplicate parts in case of breakage. Those who make standard machines, however, would confer a very great favor on their patrons if they would, in addition to cuts of machines, publish in their catalogues sectional or skeleton views with the different parts numbered. Then, when a machine breaks down the operator can order by telegraph, if necessary, giving the number of the part broken. Hardly any two machines from different shops will agree upon the technical name of an inferior or subordinate part of a machine, although they may always correctly designate the main working parts. Shop phrases and special terms are current in one establishment which are a totally unknown language when used in speaking to a workman employed in another shop. The language is still more mystical to the operator on the machine, who may not be a practical machinist, but in every other respect a trained workman, thoroughly competent and perfectly equipped to perform his task on it. Take for instance, a steam hammer. The hammerman may be an expert in the use of the tool, but know very few of the technical names of the parts. If his hammer breaks down he is at a loss how to describe the portion broken, unless it is one of the main parts or he has been so long in his position that he has somehow picked up the terms employed. In his ignorance of the names used he would probably have to make a sketch of the broken part and send that by mail, or forward the pieces by express or freight and lose a great deal of very valuable time, which would be saved if he could order by number by telegraph. This is assuming that builders of machinery issue catalogues. All of them do not, however, it being a remarkable fact that some very important engineering establishments in this country consider a catalogue superfluous. When written to for a list of their standard machines they can only furnish photographs of a few, and make their customers work in the dark if they desire to order other sizes or patterns. The catalogue is an essential in the systematic dispatch of business, and next comes the sectional views with numbered parts as an important chapter in the table of contents.

The Copper Syndicate and the Manufacturers.

The report, so quickly contradicted, of the closing down of the Anaconda mine under an arrangement with the syndicate has again given rise to a good deal of discussion. The story seemed plausible, because it was well known that negotiations between the two parties were in progress. The Anaconda is the only large producer which had a contract for only one year. This contract is about to expire, and the power of the owner of the mine, and the capacity of the latter, put him into a position where he can drive a very hard bargain. It is probable that the report alluded to foreshadowed to some extent the arrangement which may ultimately be made, though it would reduce the profits of the syndicate on its American mines to a very small amount, if, indeed, it did not swallow them entirely.

Those in sympathy with the syndicate express the greatest confidence in its strength. They insist that the most trying time, due to the appearance in the markets of the world of supplies invisible before the advance, is over; that consumption of new copper is increasing rapidly; that production has reached a maximum, and that it is not even up to the engagements of the syndicate. In this country, it is said, the Calumet and Hecla, Tamarack, Boston and Montana, and other leading mines are behind their deliveries to the French ring. The reported accumulations of Anaconda matte in this port at Baltimore and at New Orleans are claimed to be due to the rise in freights and the scarcity of tonnage some time since; they are merely stopped in transit, and are not held back to make the statistical position in copper in the world look less serious than it really is.

So far as the American manufacturers are concerned the syndicate insists that they have been treated very leniently. Some of them, it is said, have taken advantage individually of the fact that the raw material has been supplied to them at a price considerably below the nominal market price. Copper sold at 16½ cents has been put at the syndicate at the exchange market quotation, but not without the knowledge of the syndicate, which has traced its origin, and has shown that it possessed that knowledge. Attention is drawn to the alleged fact that in reality American manufacturers are getting their copper at a lower price than those abroad, that casting brands are cheaper here to manufacturers than G. M. B brands are to English makers, that Lake copper is lower at 16½ cents here than it is abroad. Although the threat is not uttered, the possibility of putting our makers on the same basis with the Europeans is pointed out. The idea is scouted that the syndicate would, as a manufacturer, spoil the market of its customers for ingot copper in this country. While it is conceded that prices are very low in some branches of the trade here, when taking the cost of the metal into consideration, this being the case notably in brass, which is selling at 16½ cents a pound, it is insisted that in other departments the prices of manufactured goods are kept at figures which leave exorbitant margins. American manufacturers, it is urged, have only themselves to

blame if they invite competition in spite of the fact that they get their copper cheaper than European rivals.

It is stated that at present prices on both sides of the Atlantic there is a possibility that large contracts for copper wire rods could be placed here from abroad. If such a business were done it would create a great outcry among the manufacturers on the other side of the Atlantic, and might lead to an adjustment by the syndicate of prices to consumers both in Europe and here. In other words, the syndicate has dealt leniently with the manufacturers. It has winked at the practices of some who have made it take back at a higher price copper sold with the express understanding that it was to go into consumption. It has kept the price of copper lower to them than to others. It has the power, and may possibly exercise it, of placing European manufacturers on a basis much nearer to that at which competition is possible.

Such are briefly some of the views expressed by those who are in sympathy with those who claim to have restored the metal to its proper position in the markets. We need hardly add that our sympathies are not enlisted on that side. We believe, with the conservative element in the trade, that the intervention of the syndicate is a misfortune to great interests, and that every day added to the period of its tenure of power must aggregate the evils of an artificial condition of affairs. We are as firmly convinced of the ultimate fearful collapse of the gamble as its most virulent opponents, but we hold that present conditions must shape the course of every one in the trade, and they, we repeat, point unmistakably to a continuance of the sway of the syndicate for some time to come.

Bolivia's Revolution and the Silver Supply.

Since November 27 silver has again declined in the London market from 43d per ounce to 42½d, due to the absence of demand for India, on the one hand, and to dearer money in Europe generally, on the other. The advance in silver in the summer has gradually been lost, but the outlook seems to point to higher rather than lower rates in the future. Both Russia and Brazil, in view of contemplated financial reforms, will be buyers of silver to a notable amount ere long, while silver production is not likely to exceed last year's but may be less. Since 1860 the world's silver production was shaped as follows, reduced to tons of 1000 kg.:

	1860.	1865.	1870.	1875.	1880.	1885.
	Tons	Tons	Tons	Tons	Tons	Tons
United States..	7	174	301	565	981	1,137
Mexico.....	457	473	521	602	656	754
Bolivia, Chili,						
&c.....	205	191	230	375	350	430
Germany.....	55	68	89	143	164	223
Oth'r countries	172	195	198	285	300	308
Total.....	896	1,101	1,339	1,970	2,451	2,862

A quarter of a century has sufficed to raise production in the New World from 669 tons to 2321, almost quadrupling it, while Europe and other countries about doubled theirs. Last year we produced \$53,357,000, against \$51,000,000 in 1886, and the stock held on July 1, 1888, was:

Silver dollars.....	\$299,708,790
Subsidiary silver coin.....	76,406,376
Silver bullion for coinage.....	3,950,388
Melted trade dollars.....	6,545,554

Silver.....	\$386,611,108
Gold coin and bullion aggregated.	705,818,855

Total metallic stock..... \$1,092,429,963

This was distributed as follows:

United States Treasury.....	\$504,533,172
National banks.....	105,435,492
Other banks and circulation....	392,461,299
Total.....	\$1,002,429,963

Even supposing that during the year now drawing to a close our production increases a couple of million dollars, nothing threatens silver from this country so long as the Bland bill remains unrepealed. As the next Congress is constituted there is, it must be confessed, little prospect that the bill will be repealed in a hurry. Mexican silver production is on the increase, but the latter is not likely to exceed \$5,000,000 per annum in any year, as silver mining and access by rail are for the moment in the neighboring republic, whereas in Bolivia, the third country in rank as a silver producer, we have to deal with a widespread revolution which hampers production and absolutely stops exportation. Bolivia turns out in a politically quiet year no less than \$20,000,000 of silver. Potosi produced from 1544 to 1572 \$250,000,000, from 1572 to 1627 \$340,000,000; it then fell off to \$3,000,000 per annum, but gradually recovered till 1809, when the war of independence put a stop to mining for 16 years, since when there has been a steady increase in the silver-lode districts. The Cerro Rico de Potosi from 1544 to 1887 has yielded a little over \$2,000,000,000 in silver. As a general thing during the past 15 years war and revolution have interfered comparatively little with mining operations in the silver districts of Bolivia, but frequently for a while with export, the roads being bad and the distance from the Pacific great. Miners pay no taxes, and the export duty is only 58 cents on about ½ pound American on silver, gold being free, and mining machinery entering duty free. Timber is scarce, and with it better fuel than *taquia*—llama dung—and *caveto*—moss. But these disadvantages have been somewhat diminished, for by means of the Mallendo-Arequipa-Puno Railroad, connecting with steam navigation on Lake Titicaca and the stage roads from Chililaya or Puerto Perez to La Paz, and thence to Corocoxo and Cruro, an extensive mining region has been made easier of access, while the steady advance of the railroad system now extending westward in the Argentine Republic toward Southern Bolivia is greatly facilitating the reopening of the Potosi mining district, which has lately been undertaken by an Anglo-Bolivian Company. The Huanchaca mine produced in 1885 \$4,819,146 worth of silver ore, netting the company for the year \$2,080,000. Even during the war on the Pacific \$20,000,000 were invested in new mining enterprises, and all this money was raised in the country.

Since the revolution broke out in September last railroad communication between Mollando and Lake Titicaca has ceased, the transportation of goods and bullion on mules' backs likewise, mine owners and merchants not wishing to expose their property to being plundered in transit and mule drivers refusing to run the risk of their lives. Bolivia mining shares suffered a serious decline in Valparaiso, but by latest accounts recovered part of it. President Aniseto Noce, elected last summer, and his cabinet are wandering from place to place, after fleeing from the capital, Sucre, and muster-

ing forces to resist the rebellion led by Pacheco and Rivadeneira. So far as accounts go, decisive engagements have not yet occurred, though a good many lives were lost in a street fight in Sucre. How long the struggle may last in a mountainous country 1,139,250 square kilometres in extent is doubtful. While it does the silver supply will be restricted from that important source.

The Blast Furnaces on December 1.

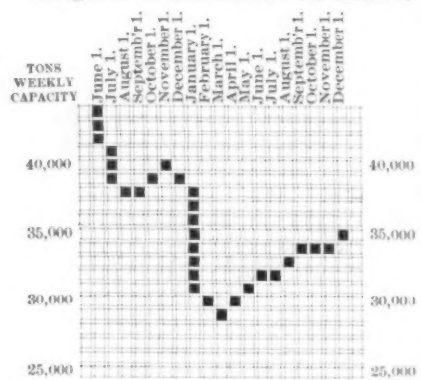
Again we can record a notable increase in the capacity of the blast furnaces at work, the principal advance being made in the coke plants. We accompany our report by diagrams, which show at a glance the general change for a period extending over a year in the case of the anthracite and the coke stacks. They convey a better impression than a brief study of the accurate figures reproduced in the summaries following the tables.

On the first of the month the condition of the anthracite furnaces was as follows:

Anthracite Furnaces December 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	24	10	3,364	14	4,095
New Jersey.....	10	4	1,492	6	2,982
Spiegel.....	3	3	230	0	0
Pennsylvania:					
Lehigh Valley....	44	26	9,072	18	5,600
Spiegel.....	1	1	60	0	0
Schuylkill Valley.	38	21	6,872	17	4,531
U. S. Susquehanna Valley.....	17	10	3,199	7	1,606
Lebanon Valley....	16	12	5,706	4	1,615
L. S. Susquehanna Valley.....	22	12	4,384	10	2,386
Total.....	185	99	34,879	76	22,705

Diagram of Anthracite Furnaces.



For a year past our records show the following:

	Furnaces in blast.	Capacity per week.
December 1.....	99	34,879
November 1.....	95	33,645
October 1.....	95	33,728
September 1.....	92	33,541
August 1.....	93	33,397
July 1.....	92	32,478
June 1.....	89	32,418
May 1.....	96	31,003
April 1.....	94	30,496
March 1.....	98	28,598
February 1.....	97	29,989
January 1.....	118	28,206
December 1, 1887.....	122	29,487
November 1.....	124	40,028
October 1.....	123	39,440
September 1.....	125	38,328
August 1.....	129	37,930
July 1.....	128	40,742

Among the anthracite furnaces the principal events are the blowing in of the Hudson, continued heavy work on the part of Musconetcong, in New Jersey, the resumption on the part of Mount Laurel, No. 2 Brooke, the fifth Crane and Lochiel furnace. Among those which are prepar-

ing to go in, or have already done so since the 1st inst., are Merion, Montgomery, Chester, Marshall and Lebanon Valley. During November Bethlehem and the Thomas Iron Company each blew out one furnace. The Lehigh spiegel furnace was idle, relining, during a part of the month.

The status of the coke furnaces was as follows:

Coke Furnaces December 1.

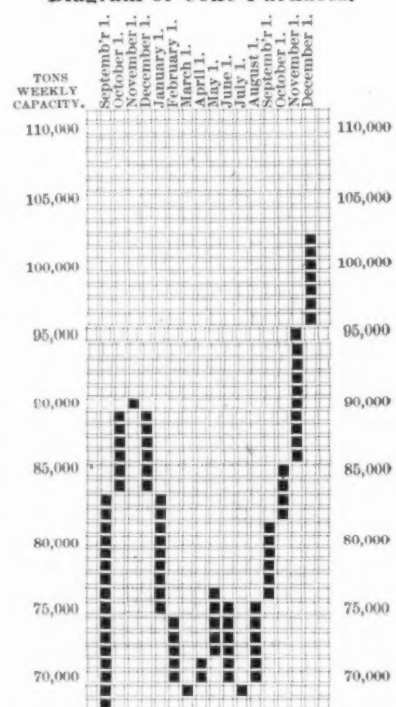
Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	3	1	1,017	2	1,850
Pennsylvania:					
Pittsburgh district.....	19	19	22,026	0	0
Spiegel.....	1	1	593	0	0
Shenango Valley....	19	15	11,065	4	2,045
Juniata and Conemaugh Valley.	18	10	6,020	8	2,891
Spiegel.....	1	1	430	0	0
Yough Valley.....	5	4	1,653	1	600
Miscellaneous.....	4	4	2,030	0	0
Maryland.....	2	1	250	1	120
West Virginia.....	6	4	2,604	2	360
Ohio:					
Mahoning Valley..	14	9	7,251	5	3,540
Central and Northern.....	18	13	9,171	5	3,602
Hocking Valley....	14	3	1,706	11	1,720
Hocking Rock.....	11	6	1,470	5	1,033
Indiana.....	2	2	383	0	0
Illinois.....	13	11	12,041	2	1,500
Michigan.....	1	0	0	1	250
Wisconsin.....	4	2	905	2	1,352
Missouri.....	6	1	584	5	2,130
Colorado.....	1	1	405	0	0
The South:					
Virginia.....	11	8	3,394	3	2,117
Kentucky.....	4	4	1,019	0	0
Alabama.....	21	18	10,321	3	1,300
Tennessee.....	11	10	4,645	1	450
Georgia.....	2	1	525	1	200
Total.....	211	151	101,748	70	28,120

	No. of furnaces.	Capacity per week.
December 1, 1888.....	151	101,748
November 1.....	146	94,095
October 1.....	137	85,461
September 1.....	133	81,082
August 1.....	122	74,855
July 1.....	121	69,543
June 1.....	128	75,427
May 1.....	130	75,815
April 1.....	128	70,644
March 1.....	128	68,892
February 1.....	136	73,912
January 1.....	143	83,101
December 1, 1887.....	144	88,835
November 1.....	151	90,459
October 1.....	152	89,123

In New York, a second Troy furnace is about to go in on foundry iron. In Pittsburgh, for the first time, every furnace is in blast, the new Soho having gone in on the 15th ult. Two more furnaces are in course of construction, one by Laughlins & Co., and the other by the Carrie Company; with them the capacity will be little over 25,000 tons a week. In the Shenango Valley Spearman started in during November, and the second Stewart has since been blown in. The returns from nearly every furnace show a November product of 46,352 tons, against 46,530 tons in October, so that practically the district is close to its maximum capacity of 50,000 tons, taking into account that one or the other furnace is always likely to be out for repairs. There are no changes to note in the Juniata and Conemaugh Valleys, or on the Youghiogheny, the total product of the latter having been 7084 tons. To the furnaces grouped under miscellaneous has been added the new Cameron furnace at Emporia. Center is running, and so is Bellefonte, which, however, lost a week in making repairs. So far as West Virginia is concerned, we may note a particularly heavy product for the Riverside. In the Mahoning Valley Grace stopped on the 24th ult., and Himrod suffered from an accident, the product of the district falling off from 38,649 tons in October to 35,809 tons in November. Among the furnaces grouped under "Central and Northern Ohio," we may note the blowing in of No. 1 Cherry Valley on the 15th ult. This is, however, more than coun-

terbalanced by the stoppage of one of the furnaces of the Cleveland Rolling Mill Company, and the blowing out of Jefferson. The November product was only 40,810 tons as compared with 42,862 tons in October, and December is likely to show only 38,000 tons. In the Hocking Valley Akron went in and Gore, which has put in a new hearth and inwall, is probably at work again at this writing. In the Hanging Rock region the new Blanche blew in since the 1st of this month. In Illinois Calumet was lighted on the 29th ult., leaving only one Chicago and the smallest of the Union stacks idle. The November output was 43,957 tons, against 47,503 tons in October. In the South the principal event has been the blowing in of the third Ensley furnace, on the 29th ult., and the resumption of the third South Pittsburg, which will bring the product of the Tennessee Coal, Iron and Railroad Company to over 20,000 tons a month and give it the lead of all the producers of foundry and mill irons. A few of the great steel companies only are

Diagram of Coke Furnaces.



producing more pig iron, though, of course, only for their own use. When the fourth furnace at Ensley is completed it will probably at times reach 25,000 tons a month. The second Woodward has gone in; the second De Bardeleben was not yet in blast, however. We estimate the November output of Alabama at 37,120 tons, which may be increased to close to 45,000 tons in December if all the plants do well. Tennessee and Georgia ought to add to it 23,000 tons. The Virginia furnaces made in November 13,970 tons, Lynchburg having blown in on the 8th, and Pulaski having run during all the month with only one engine, the other being under repairs. The furnaces ought therefore to come up to 15,000 tons in December. Kentucky turned out 4369 tons in November. Taking the furnaces grouped together as the Southern, nearly all of which work for the open market on foundry and mill iron, and we reach a probable December output of 87,500 tons. This is at the rate of over 1,000,000 gross tons annually. Now there are under construction and partly completed, to go into blast during the winter, 11 furnaces in Alabama, not counting plants on which work has recently begun. Taking the average of the furnaces blown in during the last two

years, 2800 tons a month is a very liberal allowance for them. In the spring of 1889, we may, therefore, arrive at a total product of between 110,000 and 120,000 tons monthly, providing the fuel supply is adequate. By way of comparison we may state that in December, 1887, Alabama produced 18,084 gross tons; Tennessee, 17,621 tons; Georgia, 3428 tons; Virginia, 13,448 tons and Kentucky 1620 tons, a total of 54,201 tons. The great increase has, of course, taken place in Alabama.

The production of charcoal iron has fallen off slightly, the details being given below:

Charcoal Furnaces December 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	14	8	605	6	495
New York.....	10	4	511	6	400
Pennsylvania.....	23	5	450	18	624
Maryland.....	8	3	262	5	300
Virginia.....	23	6	258	17	690
West Virginia.....	3	0	0	3	165
Ohio.....	18	6	426	12	829
Kentucky.....	2	2	208	0	0
North Carolina.....	2	1	90	1	80
Tennessee.....	9	6	1,389	3	740
Georgia.....	2	0	0	2	114
Alabama.....	10	9	1,752	1	80
Michigan.....	25	11	3,332	14	3,280
Minnesota.....	1	0	0	1	190
Missouri.....	4	2	611	2	320
Wisconsin.....	10	4	1,447	6	810
Texas.....	2	2	315	0	0
California.....	1	0	0	1	230
Washington Ter.....	1	1	270	0	0
Oregon.....	1	1	330	0	0
Total Dec. 1.....	169	71	12,280	98	9,397
Total Nov. 1.....	169	73	12,724	96	8,941
Total Oct. 1.....	175	71	11,619	104	9,083
Total Sept. 1.....	176	67	11,243	109	10,004
Total Aug. 1.....	176	65	11,137	111	10,095

In Maryland Muirkirk has been completely rebuilt since the fire, the plant having been modernized. It has probably blown in at this writing. In Virginia Beverly, Cave Hill, Cedar Run, Foster's Falls, Reed Island and Speedwell are running. In Ohio Jefferson produced only a few days in November. It will resume during the current month. In Michigan Eureka stopped on the 14th ult. but has again blown in. Fayette went out until the spring, and Pine Lake also blew out on the 20th ult. for the winter. Peninsular, too, is idle, thus reducing the output of Michigan charcoal pig considerably. In Wisconsin Hinkle is doing large work, and Minneapolis closed the first year of its present blast on the 5th inst., with a very large total product. In Missouri Midland lost two days as the result of an accident to the hoist, and Sligo was idle from the 13th to the 24th for repairs. In the South no notable changes have taken place. The second new Nashville had not blown in on the first, the first being still run on coke.

Among their late sales the Ball Electric Light Company, of New York City, report the following: Wilmington City Electric Company, Wilmington, Del., an increase of 75 arc lights; American Electric Light Company, of Kansas City, Mo., an increase of 75 arc lights. Each of these companies before purchased of them a K., 75-light, 2000 candle power arc dynamo complete, an increase as above with a second dynamo of the same size. This dynamo appears to be attracting special attention for street and commercial lighting. Like all other dynamos of their system it has required no foundation whatever, but is simply fastened lightly with wooden blocks to the floor. In addition to these the company report the following sales: Phoenix Woolen Company, East Greenwich, R. I.; Stoughton Lighting Company, Stoughton, Mass.; Kirksville Light, Heat, Power and Water Company, Kirksville, Mo.; Stetson & Post Milling

Company, Seattle, W. T.; Edison Electric Illuminating Company, of Hazleton, Pa.; C. S. Bradford, West Chester, Pa.; Newport Light Company, Newport, Ky.; Walworth Steam and Power Company, Boston, Mass.; West Coast Electric Light and Construction Company, San Francisco, Cal., or a total of about 600 arc lights.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., December 11, 1888.

The summary bursting of the big Bessemer-steel gun and the explosion of the great expectations of its projectors have been the events of the week in ordnance circles. The superintendent, Mr. Hainsworth, and the officers of the casting company are somewhat emphatic in their efforts to shift the responsibility of the explosion to the interference of the Government officials with the tempering of the casting. The officers, however, reply to this by saying that the only work done upon it by them was the rifling, placing of the breechpin and testing the castings. The tests, they say, did not come up to the contract specifications and the gun might have been thrown out entirely. There had been so much talk about the steel cast gun that they waived this point so as to allow the gun to receive a trial and vindicate or explode the theoretic claims of the champions of steel cast guns.

The explosion of the gun on the first firing test has sent that style of gun down below par most effectually, but the experiment has been a real service, as it will be likely to shut off the incessant agitation of all sorts of schemes by unscientific men and non-experts. Senator Gorman, who has been the champion of the private competition theory of securing improved styles of ordnance, is not at all discouraged and believes in going ahead in the same line.

General Benet, Chief of Ordnance, said to the representative of *The Iron Age* today: "I was not in the least surprised at the result. No reliance can be placed on simple castings to resist the enormous strain to which modern guns are subject. The outer surfaces may look all right, but it is impossible to tell the condition of the metal within. The air bubbles and other causes of weakness, cannot be overcome except by forging."

"The failure of the gun to stand a test of 16 tons to the square inch was only a minimum showing. The strain is oftener 18 tons, and, sometimes, in cases of obstructions caused by the projectile adhering or being retarded in the bore, it runs as high as 100,000 pounds to the square inch. A Bessemer steel casting, without forging and the application of other strengthening methods, would be a very unsafe gun, either for defensive use or on board ships."

"The test of the Bessemer gun will, doubtless, put an end to that idea, as the lack of confidence in the strength of such a piece of ordnance would be very demoralizing to the men expected to work it."

General Benet said further that increased interest would now be given to the open-hearth cast-steel gun. He expects it to show greater resistance to the enormous strain, but as to the practical use of that style of gun he does not express much confidence.

Commodore Sicard, Chief of the Bureau of Ordnance, speaking of the burst gun, said: "Our calculations to determine the power of the gun did not indicate that it would stand the test. It looked well enough. In fact, was a superb piece of metal and a great credit to the skill of the workmen, but the boring showed numerous little air spaces which were calculated to weaken the gun."

"The bursting was inevitable. It was not strong enough to resist the service charge. Built up guns, with rings of steel shrunk by heat around the core, alone can resist the pressure; a simple cast steel gun cannot resist the pressure, and no thickness capable of being handled by even mechanical appliances for practical use would enable them to stand."

The universal testimony of other officers is to the same effect. The statements of manufacturers of steel castings, who are authorities on the subject, agree that unless some new methods of treatment are discovered cast-steel guns will not be the guns of the future.

An elaborate report, with photographs, is being prepared by the officers in charge for the information of the Department. The officers of the line of the navy say that the Government could not expect either officers or men to stand by guns in action which would be liable to explosion at every discharge. Had not precautions been taken against accident in this instance there would have been serious results from the firing test of the cast-steel gun. Fortunately there were no disasters except to the gun. The Senate has been giving tariff hearings during the week on various industries. The tin-plate interests were heard, Messrs. Swank and Jarrett arguing in favor of a protective duty of 2 to 2½ cents a pound. The argument was an unnecessary consumption of the time of the committee, who courteously listened, however, as there was an agreement among them before the adjournment to incorporate an amendment into the bill in the Senate placing that duty on tin plate. This is one of the certain things that the committee does favor, and therefore the subject requires no further agitation. The reduction of the duty on tin plate was an inexcusable movement in the interests of foreign manufacturers which the committee will remedy. The wire interest is to be heard to-morrow, Wednesday.

The debate on the tariff bill in the Senate was attended with some surprises during the past week. The display of a lower duty tendency among certain Western Republicans indicates some uncertainty in that quarter. Senator Plumb was disposed to attack certain features of the tariff schedules. The letters and telegrams received by the committee for hearings are coming in daily, and in numbers which would run the committee into the summer.

Senator Allison is pushing the bill in the Senate with the utmost energy. He is still in expectation of securing the passage of the bill—if not before the holidays very soon after.

It is reported that the Coke Consumers' Association, which is composed of the furnace operators of the Shenango, Mahoning and Ohio valleys, will protest against an advance in the price of coke at the opening of the year. Mill iron is selling at \$16, and at this figure they claim that they can stand no advance in coke. On December 1 they gave their employees a 10 per cent. advance and ore has gone up 50 to 75 cents, which increases the cost of making a ton of pig iron from \$1 to \$1.50. If coke went up to \$1.50 it would increase this from 30 to 40 cents.

Joseph J. B. Frey, manager of the Martin Iron Works, of this city, was killed on Tuesday while returning home from a visit to a relative in Elizabeth, N. J. Mr. Frey's body was picked up on the Newark Bay bridge of the Jersey Central Railroad, and it is supposed he was accidentally thrown off the train.

Eight fires on cotton-laden vessels have already occurred this season, but the origin of these fires is as much of a mystery as ever.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, December 10, 1888.

In some respects the past week has been much more satisfactory than its immediate predecessors. As foreshadowed in previous reports, decided activity has suddenly become the feature of the trade in several lines, notably in Steel Nails, the increased demand being accompanied by higher prices. Even in the branches of business now experiencing dullness there appears to be no lack of confidence, and sellers manifest no uneasiness as to the future, believing that the generally healthy condition of business throughout the country will stimulate trade toward the close of the year, or, at furthest, early in January. More orders for cars are coming forward, and, although they are not so large as car-builders would like to see them, they are sufficiently numerous to impart a feeling of strength to the interests directly affected. The railroads are beginning to feel the effects of the enormous crop of corn, and their increasing earnings promise to furnish an important factor in the prosperity of the country in the coming year.

Pig Iron.—The demand for Strong Coke Foundry Iron continues to be the only feature of the market worthy of special notice. Good sales are being made of that class of Iron at very close to full prices. The lower grades are particularly firm, owing to the scarcity and high price of competing grades of Southern Iron. Very little movement is reported in Charcoal, Soft Coke or Southern Coke Irons. Charcoal is very stiff, with the inquiry principally for high numbers from the Car-Wheel manufacturers. As the time of the year is approaching in which season contracts are placed for this class of material the manufacturers are less inclined than ever to make concessions or to vigorously push sales. Reports are current of Southern Coke Foundry at concessions from regular quotations, but the lower grades are as firmly held as was reported last week. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1 and 2, \$20; Nos. 3 to 6, \$20.50 @ \$21; Alabama Car-Wheel, \$26.25; Jackson County Softeners, \$18.60; Hocking Valley Soft Foundry, No. 1, \$17.50 @ \$18; American Scotch (Black-band), No. 1, \$19.50 @ \$20.50; other Ohio Soft Irons, No. 1, \$17.50 @ \$18; Lake Superior Coke, No. 1, \$18 @ \$18.50; No. 2, \$17 @ \$17.50; No. 3, \$16 @ \$16.50; Coke Bessemer, \$17.50 @ \$18; Southern Coke, No. 1 Foundry, \$17.25; No. 2 Foundry and No. 1 Soft, \$16.75; No. 3 Foundry and No. 2 Soft, \$16.25 @ \$16.50; Gray Forge, \$16.

Bar Iron.—Orders for Bar Iron were placed during the week at 1.72½¢ @ 1.75¢, flat, Chicago, and further orders of the same character are in the market. The situation is unchanged as to prices, ordinary specifications for Common Iron ranging from 1.72½¢ to 1.75¢, half extras, Chicago. Some good orders for Splice Bars have been taken at about 1.85¢, Chicago, and other lots are now under negotiation. Small lots of Common Bars are still selling at 1.90¢ @ 2¢ from store.

Structural Iron.—The most important order placed during the week was the contract for 1200 to 1500 tons of Steel Beams and Girders for the reconstructed Chamber of Commerce Building, which was secured by Jones & Laughlins, and is described in greater detail elsewhere. The contract for building a mile of elevated railway in the city, on the so-called "Alley" route, will

probably be let this week. Mill lots are quoted as follows, f.o.b. Chicago: Angles, 2.15¢; Universal Plates, 2.20¢ @ 2.25¢; Tees, 2.55¢ @ 2.60¢; Beams and Channels, 3.40¢. Small lots from store command the following rates: Angles, 2.35¢ @ 2.50¢; Tees, 2.60¢ @ 2.70¢; Beams, 3.80¢.

Plates, Tubes, &c.—A fair movement is reported in small lots of Plates, but orders for large lots have been lacking. Good orders are in sight, but they are slow to materialize. Quotations from store are firmly maintained as follows: Heavy Sheets, Nos. 10 to 14, 2.60¢ @ 2.70¢; Tank Iron, 2.55¢ @ 2.65¢; Tank Steel, 2.80¢; Shell Iron, 3¢; Shell Steel, 3.25¢; Flange Iron, 4.25¢; Flange Steel, 3.75¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢. Boiler Tubes, 60 % off.

Sheet Iron.—No change worthy of note has occurred in either Black or Galvanized, the demand continuing as active as at any time during the fall, except for Stove Pipe and similar common grades, for which the season is about over. Small lots of Black are quoted at 3.10¢ for No. 24; 3.20¢ for Nos. 25 and 26, and 3.30¢ for No. 27, and of Galvanized at 60 % and 5 % off for Juniata and 60 % and 10 % off for Charcoal.

Merchant Steel.—General business in this line has now been very quiet for two or three weeks, with but little prospect of an early change. Bessemer Bars have been sold at 2¢ from store. Other stock prices are as follows: Tool Steel, 8.50¢ @ 9.50¢; Specials, 13¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢ @ 2.75¢; Crucible Sheet Steel, 7¢ @ 10¢.

Steel Rails.—An increasing inquiry from leading Western roads is imparting a better tone to this branch of trade, and is causing the local manufacturers to take a more cheerful view of the situation. Some heavy contracts are pending, and if contemplated extensions in the Northwest are actually undertaken other heavy purchases will be made. New schemes are coming forward also, but the prospects of business for the Steel Rail mills in that direction are necessarily remote. Prices will be more firmly held in this market hereafter, as Eastern competition is now practically ended by either the filling up of mills or their withdrawal from the Rail trade, and the local companies have about completed an arrangement for the amicable division of business. They still name \$30 as the basis of negotiations.

Old Rails and Wheels.—Consumers of Old Iron Rails are unable to supply themselves at lower rates than those recently quoted. For a lot of 500 tons picked up in the interior of the State, the buyers were obliged to pay \$23. This is equivalent to about \$22 at Chicago, but at that price no Rails can be had here, holders asking \$23.50. Judging from reports received here, the supply seems to be larger at points further east. Old Car-Wheels are at a standstill. Parties are trying to buy a few hundred tons, for which they offer \$19.25, but holders ask \$19.50.

Scrap.—The outlook is considerably better. Carload orders for Wrought are fairly brisk, sales of No. 1 having been made at \$21. Large blocks of Railroad Scrap have been offered, and from \$21.50 to \$21.75 has been realized for No. 1 Wrought, and \$20.75 for Track. City dealers are firmer in their views. Mixed Country Scrap is unchanged at \$14 @ \$15. Dealers' prices for carefully selected Scrap are as follows, per ton of 2000 lb: No. 1 Forge, or Railroad Shop, \$21 @ \$21.75; Track Scrap, \$20.75; Fishplates, \$22; Horseshoes, \$20; Axles, \$26; No. 1 Mill, \$16; Pipes and Tank, \$13.50;

Light Wrought, \$10; Cast Machinery, \$13.50 @ \$14; Stove Plate, \$11.50; Cast Borings, \$9 @ \$9.50; Wrought Turnings, \$11; Axle Turnings, \$13.50 @ \$14; Coil and Leaf Steel, \$17; Locomotive Tires, \$16.

Hardware.—Jobbers of Shelf Hardware are busier than ever, an immense trade now being conducted. The demand is heavier than it was last year at this time, although it was then far ahead of any previous year. The assortment of goods called for is general in its character, but Staple goods are now moving much more freely than they have been of late. This rush of business will hardly continue very long, however, as the jobbers will soon begin to call in their traveling salesmen to get matters in readiness to take account of stock. Collections are very good. In Heavy Hardware a fair business is reported, but no unusual activity prevails.

Nails.—In Steel Nails the situation has been radically changed since our last report. Manufacturers' agents have taken large orders, and the price has been advanced by most of the factories 12½¢ per keg. The bottom price for large lots now seems to be \$1.87½, Chicago. The jobbers are having a heavy demand from all parts of the West and Northwest, and some of them have taken more carload orders in the past week than for months. To check sales and prevent stocks in retailers' hands from reaching too large proportions, they are advancing prices. For small lots from store \$2 is now asked, and \$1.95 for carload lots on track, but these prices are not expected to hold good more than a few days. The belief is quite general that Steel Nails will be considerably higher before the advance is checked. Small lots of Wire Nails are quoted at \$2.55 @ \$2.60.

Barb Wire.—The demand is growing, and this branch of trade is gradually working into better shape, but the large manufacturers are still making more Barb Wire than they are selling. They anticipate a heavy demand, which may come as suddenly as the demand for Nails sprung up, and when it comes they will be well prepared to meet it with full warehouses. Prices are a little stiffer, but there is no quotable change, small lots of Painted selling at 2.90¢ and Galvanized at 3.60 @ 3.65¢.

Pig Lead.—While very little actual business has been transacted, prices have advanced in sympathy with the upward movement in other markets, and at the close of the week 3.55¢ was bid and 3.60¢ asked.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. PHILADELPHIA, Pa., December 11, 1888.

Pig Iron.—The market has been very quiet during the past week, and in spots some little weakness has been developed. Taking the market as a whole, however, the feeling may be considered steady to firm, notwithstanding dullness and occasional symptoms of weakness, as already mentioned. Really good brands are held with absolute firmness, while other descriptions are irregular, and in some cases might possibly be had at comparatively low figures if firm offers were made for good sized lots. The trouble is that the brands wanted are so far sold ahead that makers are not desirous of increasing their lines at present quotations, while those that can be had are not such as buyers care to have, unless at a wide disparity in prices. The consequence is that the feeling is firm in one direction, but weak and uncertain in another, so that the trade hardly know what to think of the position. Two or three weeks more of dull-

ness would probably start a decline, but on the present basis of cost it could not be of much importance. On the other hand, a moderately active demand would be likely to absorb all the low-priced lots and place the market in a very firm position for the first quarter of the incoming year. Under these circumstances, there is a degree of hesitancy somewhat unusual, considering the low price of Iron, the high cost of Ores, &c. Moreover, stocks of Iron are light in comparison with the large consumption, and it would not require much increase in the demand, nor much of a falling off in production, to cause quite a scarcity of desirable qualities of Iron. The immediate conditions, however, are not such as to encourage hopes of higher prices, neither are they so discouraging as to warrant expectations of a decline, so that for reasons already given leading makers are no more anxious to sell than consumers are to buy, until some definite idea can be formed as to the volume of business likely to be forthcoming during the early portion of the coming year. On this point there are not sufficient data to warrant very confident predictions, although the general idea is that 1889 will be a year of great activity; the uncertainty is more in regard to the near future than to the ultimate result. This uncertainty curtails business for the present, neither side being willing to make the first move. Prices, therefore, remain same as last week, say \$16 @ \$16.50, at tide, for Gray Forge; \$17 @ \$17.50 for No. 2 Foundry, and \$18 @ \$19 for No. 1. A little beyond the outside figure for choice brands, but nothing of standard quality below the inside quotation.

Blooms.—No change in prices, demand fair at about the following quotations, according to analysis, &c., say—Steel Nail Slabs, \$28.50 @ \$29, at mill; Billets, from \$32 to \$36, according to analysis; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$42 @ \$44; Scrap Blooms, \$32.50 @ \$34 per "bloom" ton of 2464 lb.

Muck Bars.—The demand is lighter than for weeks past and prices are easier all around. Holders ask from \$29, at mill, to \$29.50, delivered, but buyers show no disposition to take hold at present, unless in small lots for immediate use.

Bar Iron.—The market is quiet and irregular, with no chance of getting business unless at low prices. This, of course, may be only temporary, but, in the meantime, if one mill refuses an order because of the low price the chances are that others will take it sooner than miss the opportunity of work to start the new year with. Consequently 1.75¢ @ 1.8¢ are the usual quotations on lots of 100 tons and upward, although nominal rates are 1.85¢ @ 1.90¢ for Best Refined Iron. As a rule, a fair amount of business of this kind has been secured, so that if the demand should pick up again it might not be a matter of much difficulty to stiffen prices to 1.80¢ or 1.85¢ as a minimum. Skelp Iron is quiet, with sellers at from 1.9¢ to 1.95, but there is no demand of any amount, so that quotations are merely the asking prices.

Plate and Tank Iron.—The feeling is a little weaker in this department, sales of Plates having been made to shipbuilders at very low prices. There is an impression, however, that the weakness will not be of long duration, as a great deal of work is in sight for the new year. Meanwhile, some of the mills are still anxious for business, and, to secure orders for round lots, prices would be shaded a trifle for desirable deliveries. Quotations are irregular, but nominally as follows: Ordinary Plate and Tank Iron, 2¢ @ 2.10¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and

Ship Plate, 2.25¢ @ 2.3¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—Business is very quiet, orders for large lots being unusually scarce. The dullness is not likely to be very protracted, however, although orders could be placed to good advantage if they were promptly offered. There is the usual talk of large operations to be undertaken at an early date, but there is more or less uncertainty on this point; hence, increasing weakness in prices, which are nominally as follows: 2¢ @ 2.10¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron.—Dull; only small lots called for at quoted rates, which are about as follows for the best makes:

Best Refined, Nos. 26, 27 and 28... 3¼¢ @ 3½¢
Best Refined, Nos. 18 to 25... 3¢ @ 3¼¢
Common, ¼¢ less than the above.
Best Bloom Sheets, Nos. 26 to 28... 4¼¢ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25... 4¢ @ 4¼¢
Best Bloom Sheets, Nos. 16 to 21... 3½¢ @ 3¾¢
Blue Annealed... 2.8¢ @ 3¢
Best Bloom, Galvanized, discount... 62½¢
Common, discount... 67½¢

Merchant Steel.—There is not much demand, and prices are unchanged, as follows: Tool Steel, 8½¢; Machinery, 2.6¢; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Steel Rails.—There is not much business doing at the prices now asked, but makers seem to be firm at \$27.50 @ \$28 at mills. Western mills are said to have taken some large orders within the past few days, but for the present only small orders seem to be within reach of the Eastern mills. Sales for 1889 delivery aggregate about 500,000 tons up to this date.

Old Rails.—There is a fair demand, but any attempt to buy good-sized lots leads to an immediate stiffening in prices, showing that stocks are extremely limited. Sales of small lots have been made at from \$24 to \$24.50, delivered at mill in the interior, and \$23.50 is bid for Philadelphia deliveries, and \$24 @ \$24.50 asked.

Scrap Iron.—The market is steadier and sales have been at about the following quotations: \$21 @ \$21.50 for cargo lots; \$21.50 @ \$22.50 for carload lots, delivered, or for choice \$23; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$25 @ \$26. Old Car-Wheels, \$17 @ \$18, Philadelphia, or its equivalent.

Wrought Iron Pipe.—There is a moderate demand, considering the season, and prices are fairly steady, although there is more or less irregularity in the case of large orders. Discounts nominally as follows: Black Butt-Welded, 52½¢; Galvanized do., 42½¢; Black Lap-Welded, 62½¢; Galvanized do., 52½¢; Boiler Tubes, 60¢.

Nails.—There is no change to notice in this line. Store prices are \$1.90 @ \$2, but carload lots of some brands are offered at \$1.80 @ \$1.85, and, although they are not such Nails as people want, they have a very demoralizing effect on the market.

Louisville.

LOUISVILLE, KY., December 10, 1888.

Pig Iron.—The market has been quiet during the week, with but few sales to report, and those for small quantities. Buyers are not willing to purchase freely until the close of the year. Advances from our customers, however, are to the effect that they expect to buy in January, and it is thought there will be no decline in the market. There has been no change in prices during the last week, and sales have been made at about the prices quoted

heretofore. Unless something unusual interferes it is thought January will bring buyers at present prices, and the tendency will be to steady the market and probably advance it. All grades of Iron can be obtained, and the scarcity of Softeners is no longer felt, as this grade of Iron is offered in considerable quantities. There is a growing demand in this section for Bessemer Iron, but Car-Wheel grades are rather quiet. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$16.50 @ \$17.00
Southern Coke, No. 2 Foundry, new classification.....	16.00 @ 16.50
Southern Coke, No. 3 Foundry, new classification.....	15.50 @ 16.00
Gray Forge.....	15.00 @ 15.50
White and Mottled, different grades.....	14.00 @ 14.50
Silver Gray, different grades.....	15.50 @ 16.50
Southern Charcoal, No. 1 Foundry.....	17.75 @ 18.25
No. 1 Mill.....	16.00 @ 17.00
Southern Car-Wheel, standard brands.....	22.75 @ 23.75
Southern Car-Wheel, other brands.....	19.00 @ 21.00
Hanging Rock Coke, No. 1 Foundry.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 1 Foundry.....	20.75 @ 23.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Hanging Rock, Warm Blast.....	19.00 @ 20.00

Cincinnati.

Office of The Iron Age, Fourth and Main Sts.,
CINCINNATI, December 10, 1888.

Pig Iron.—The feature of special prominence in the local market during the week has been the urgent demand for Car-Wheel Iron reflecting the large orders placed for new cars by some of the largest railroad companies in the country. The standard brands of Car-Wheel are reported to be sold well up, and of the other grades much difficulty is experienced in obtaining the numbers desired. A few round lots of Forge Iron are reported to have been sold in St. Louis by Cincinnati firms during the past few days, but in the aggregate there probably has been less doing. Many large buyers have already contracted for necessities for several months ahead, and the others disposed to await the turn of the year, while small buyers are not taking hold with the avidity which sellers anticipated. Although consumption is large, production is steadily increasing. Prices of most all kinds are well sustained, and a steady but quiet market is foreshadowed until after the holidays.

Foundry.

Southern Coke, No. 1 (new classification).....	\$16.25 @ \$16.75
Southern Coke, No. 2 (new classification).....	15.50 @ 16.00
Southern Coke, No. 3 (new classification).....	15.00 @ 15.25
Ohio Soft Stone Coal, No. 1.....	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2.....	15.50 @ 16.00
Mahoning and Shenango Valley.....	18.00 @ 18.50
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.50
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.50 @ 19.50
Tennessee and Alabama Charcoal, No. 2.....	17.50 @ 18.00

Forge.

Strong Neutral Coke.....	15.00 @ 15.25
Mottled Neutral Coke.....	14.00 @ 14.25
Gray Forge.....	14.50 @ 14.75

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Manufactured Iron.—There is a moderate degree of activity at present, and orders for some time ahead are booked on the basis of old quotations, and, although there is a feeling of confidence and a spirit of firmness, it does not appear likely to result in any change of prices in the near future.

Old Material.—There has been some demand, and a firmer market for Old Rails, with sales in several hundred ton lots at \$23.50 per ton, spot cash. Old Wheels have remained quiet, but steady, at \$19, spot.

Nails.—There has been a fair demand, but the market has been more freely supplied and prices have been barely sustained.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, December 10, 1888.

Pig Iron.—It is being claimed by some that the demand has fallen off to some extent during the past two or three weeks. This may be so, to some extent, which can be readily accounted for, from the fact that it being near the close of the year when all manufacturing concerns desire to put their stock and accounts in the most tangible shape, to enable them to ascertain their financial condition as near as possible at the close of the year; yet it is a fact that prices have been fully maintained, and there are no evidences of weakness as yet in sight. It may have been true, perhaps, that a very few holders have sold at a slight concession, but they are exceptions if they have occurred. The better way to judge of the true condition of the market is to refer to actual sales that have been made from time to time during the past two weeks. In this time several round lots of No. 1 Foundry have been sold to go East, netting the furnaces \$14.25, less 2½% commissions. These sales aggregate 9500 tons, deliveries to run monthly to April 1. These sales were made for cash on delivery, but the cash is seldom realized under 30 to 40 days from date of shipment. We also note a sale of 2000 tons No. 3, at \$13, four months, at furnace bank, deliveries to run till May 1. Inquiries for spot cash iron in 100 and 200 ton lots, free of commission, and immediate delivery, f.o.b., elicit from the Birmingham district the following quotations: No. 1 Foundry, \$13.50; No. 2, \$12.25; Open Bright, \$12.75; Gray Forge, \$12.

Bar Iron.—All the Southern mills are running to their full capacity, with about three months' orders ahead, at 1.80¢ rate in carload lots. One of the mills recently sold 2500 tons on private terms.

General business is good, and all the manufacturers are running full.

Cleveland.

CLEVELAND, December 10, 1888.

Iron Ore.—With the last cargoes of Ore for the season now being unloaded at lower lake ports buyers are turning their attention to 1889, and are speculating upon possible changes in lake freights and Ore quotations. It is now believed that the question of transportation rates will be settled by January 15th, and it would not be surprising if an active buying movement set in at that time. As nearly as can now be estimated the amount of unsold Ore on the docks at Cleveland, Fairport, Ashtabula, Toledo, Sandusky, Huron, Lorain, Erie and Buffalo amounts to 170,000 tons, as against 750,000 tons at the close of last season. The total amount of Ore received at these ports during the past season slightly exceeds 3,800,000 tons, as against 3,440,000 tons in 1887, 2,270,500 tons in 1886 and 1,500,000 tons in 1885. The shipments to the furnaces from the ports above named during the season aggregate 2,650,000 tons, leaving about 1,825,000 tons of Ore on the docks at the present time, 91 per cent. of which is sold. Buffalo seems to be increasing in importance as a shipping point for Ore, the receipts at that port for the past season being 240,000 tons, as against 28,000 tons last year. Several furnacemen are now negotiating for all-rail shipments of Ore during the winter months, and sales under this arrangement will be effected within a few days. Buyers are already asking for prices on the odds and ends comprising the 170,000 tons of unsold Ore on the docks.

Pig Iron.—The market is just now passing through the quiet period always experienced at the close of the year.

Orders in any considerable quantity are not looked for before the middle of January. The prices to be paid for next season's Ore will probably have been determined by that time, and any necessary alterations in Pig Iron quotations can then be made. The consumption of Iron continues at an almost unprecedented rate, and there is no thought of taking any of the furnaces that are fit for work out of blast. The quiet tone now prevailing is accounted for by the fact that buyers do not usually want any unnecessary stocks on hand when the annual inventory is taken. It is said that \$15.90, cash was paid during the week for 900 tons of Gray Forge at the furnaces, scattering sales of Mill Iron at about \$16.50 @ \$17, cash. The reported effort of millmen to force down prices is offset by the fact that the furnacemen have not only not accumulated stocks, but are quite unable to fill their orders. The following are cash quotations:

Nos. 1 to 6 Lake Superior Charcoal.....	\$20.50 @ \$21.50
No. 1 Strong Foundry, Bessemer quality, ½ ton.....	18.20 @ 19.00
No. 1 Strong Foundry, ½ ton.....	18.00 @ 18.50
No. 2 Strong Foundry, ½ ton.....	17.00 @ 17.50
No. 1 American Scotch, ½ ton.....	18.25 @ 18.70
No. 2 American Scotch, ½ ton.....	17.20 @ 17.70
No. 1 Soft Silvery, ½ ton.....	18.50 @ 19.00
Mahoning and Shenango Valley Neutral Mill Irons, ½ ton.....	16.00 @ 16.50
Mahoning and Shenango Valley Red Short Mills, ½ ton.....	17.00 @ 17.50

Scrap Iron.—Old American Rails are again held at \$25, with a few small orders reported. No. 1 Wrought also commands high figures.

Manufactured Iron.—Small lots of Common Bar are bringing 1.70¢, with the demand far in excess of the supply. The Sheet-Iron market is very firm, No. 27 being held at \$3 and other numbers correspondingly high.

Nails.—There is no change in the Nail market. Common Iron Nails are again selling freely at \$1.90, and Steel at \$1.95.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,
PITTSBURGH, December 10, 1888.

The general Iron situation has developed nothing of importance during the past week, but the mills and furnaces generally still have about all they can do in working up old contracts. As a great many jobbers, and consumers as well, make it a point to close the year with as little stock as possible the outlook for the coming year is very generally regarded as favorable. It is expected that there will be more miles of railroads built in 1889 than ever before, and that the consumption of Pig Iron will exceed that of any former year. A cargo of 1300 tons of Southern Pig Iron arrived here from the Cumberland River furnaces the past week, and additional shipments, it is said, will be made. It is brought here all the way by river, in barges, and the freight, it is evident, is very low. The distance is about 1200 miles, and it is probable the cost of transportation did not exceed a couple of dollars per ton. There is talk here of organizing a barge line for the transportation of Iron Ore and Pig Iron from Missouri, Alabama and Tennessee to this port, and they could be loaded back with Steel Rails, Coke, Coal, &c. Large shipments of Rails have been made from here to the South for some years past by river, the rate being much less than by rail, and shipments in not a few instances are delivered as quickly by river as by rail.

Pig Iron.—There has been no important change in the situation since our last report; business continues light, as it usually is at this time, and it is not likely that there will be any improvement until after the new year, as consumers generally will make it a point to close the old one

with as little stock as possible. It is customary with a good many furnacemen to make contracts in January for Ore; some of them may contract for a year's supply, but the probability is that there will not be the same disposition to contract so far ahead unless the price is reduced considerably below what the Ore companies are now expecting to realize. In regard to Pig Iron, there is no indication of any falling off in the consumption; on the contrary, there is a possibility that the requirements of this district in 1889 will exceed those of 1888; but be this as it may, it is generally conceded that Ores have been higher this year relatively than Pig Iron, and furnacemen want cheaper Ore or a higher price for Pig Iron, and of the two they think the latter the most preferable. Prices remain unchanged as compared with those of a week ago, as follows:

Neutral Gray Forge.....	\$15.75 @ \$16.25, cash.
All Ore Mill.....	16.50 @ 16.75, "
White and Mottled.....	15.00 @ 15.50, "
No. 1 Foundry.....	17.75 @ 18.00, "
No. 2 Foundry.....	17.00 @ 17.25, "
No. 1 Charcoal Foundry.....	23.50 @ 24.00, "
No. 2 Charcoal Foundry.....	21.00 @ 21.50, "
Cold Blast Charcoal.....	25.00 @ 27.00, "
Bessemer Iron.....	17.25 @ 17.50, "

Included in the sales reported was a lot of 1000 tons Bessemer at \$17.25, cash, at which it is now freely offered.

Muck Bar.—There is less inquiry, and the market is easier, although prices remain unchanged at \$29 @ \$29.50, cash; while there was a sale of 500 tons reported at the outside quotation, \$29.50, most of the trade receive it as an outside price.

Manufactured Iron.—While there is not much new business just now, mills generally are pretty well employed in working up former contracts. Prices without quotable change, although they are not as well supported as they were a month or so ago. We continue to quote Bars at 1.80¢ @ 1.85¢; Plate, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢; Skelp, 1.85¢ @ 1.90¢ for Grooved, and 2.10¢ @ 2.15¢ for Sheared, all 60 days, 2% off for cash. There is but little demand for Skelp Iron.

Nails.—There is no change in the situation here; Pittsburgh manufacturers are still holding out for card rates and refusing to sell for less, but they are not making sales. Wheeling is said to have stiffened, but manufacturers there are still below the card, and, as a matter of course, buyers will not pay full card rates as long as they can buy for less.

Wrought-Iron Pipe.—The demand continues to fall off, and, as competition is more active, prices are being cut to such an extent that it is difficult to give reliable quotations.

Old Rails.—There is less doing, but prices are still maintained; we continue to quote at \$25 @ \$25.25, cash, for American Tees, with a small sale reported at \$25.10.

Steel Rails.—While manufacturers still quote at \$28, cash, at mill, it is claimed that orders for delivery in the North and Southwest have been accepted at prices considerably below the one quoted. Competition is active, and for desirable orders prices are being cut very close. The syndicate does not touch prices, its chief object being to regulate production.

Billets, &c.—Bessemer Steel Billets are weaker and are now quoted at \$28.50, and Nail Slabs at \$28. Some of the works are busy making Steel Ship Plates. Domestic Bloom and Rail Ends are quoted at \$19 @ \$19.50. Mills generally are pretty well employed and likely to be for some time to come.

Merchant Steel.—There is a fair business at unchanged prices. Best brands Tool Steel, 8½¢; Crucible Spring Steel, 4½¢; Crucible Machinery, 5¢; Open-Hearth Machinery, 2½¢.

Railway Track Supplies.—Spikes are quoted at \$2.15 for 30 days, but sales are reported below the price quoted. Splice Bars \$1.85¢ @ \$1.90, cash, f.o.b. Pittsburgh, and Track Bolts at 2.85¢ with square and 2.95¢ with hexagon nuts.

Old Material.—The demand continues rather light, but prices are maintained. No. 1 Wrought Scrap, \$21 net ten; Wrought Turnings, \$13 @ \$14; Car Axles, \$25.50 @ \$26.50; Cast Scrap, \$15.50 @ \$16, gross; Cast Borings, \$12 @ \$13; Car-Wheels, \$19.50 @ \$20; short pieces Old Steel Rails, \$18.50 @ \$18.75; long lengths ditto, \$20.50 @ \$20.75.

Detroit.

WILLIAM F. JARVIS & Co., under date of December 10, report as follows: The market remains in about the same condition as a week ago. A few round lots have been placed at full prices, but the majority of orders received were for small amounts and prompt delivery. Southern Gray Forge is at present most in demand. With a fairly active market we quote as follows:

Lake Superior Charcoal, all numbers.....	\$20.00 @ \$20.50
Lake Superior Coke, all ore.....	19.75 @ 20.25
Lake Superior Coke, cinder mixed.....	18.00 @ 18.50
Standard Ohio Black Band.....	19.75 @ 20.25
Southern No. 1.....	17.75 @ 18.25
Southern Gray Forge.....	16.25 @ 16.75
Southern Silvery.....	17.00 @ 17.50
Jackson County (Ohio) Silvery.....	18.50 @ 19.00
Old Wheels.....	20.00 @ 21.00

New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York, December 12, 1888.

Business in many departments of the Iron and Steel trades has drifted into a very unsatisfactory condition. Importers are doing practically nothing, and in the lines in which home products have exclusive sway the developments of the past few weeks have led to sharp disappointment. Steel Rails, it is true, have recovered somewhat from their lowest position, but the situation is not without its element of danger. But it is particularly in manufactured Steel in which demoralization is greatest. Plates and Structural Shapes, with the exception of Beams, have been sharply cut, and Merchant Steel has dropped considerably in price. With all this raw material, Pig Iron and Old Material have held their own exceedingly well in spite of an unprecedented production. The outlook for Ore points to higher values, and Coke seems certain to rise in the near future close to \$1.50 point at ovens in Connellsville. One feature in the situation is that the low prices alluded to have come almost exclusively from one quarter. Great as the capacity of the group of concerns alluded to is their withdrawal, imminent at any time, from the aggressive attitude taken may easily cause a rebound to more remunerative figures.

Foundry Pig.—The local market is quiet, and as yet the leading company have made no announcement of their intentions beyond the intimation that prices will not be higher. We hear that furnaces in the Chattanooga district have booked considerable orders for delivery in this market and New England, one furnace alone selling about 12,000 tons principally for delivery during the first three and six months, at \$18 and \$17 for No. 1 and No. 2. The principal carrier of Southern Iron has been urged to build two additional steamers, and a good deal was expected from these increased facilities. We understand, however, through a good source, that for the present this is not to be done. The greater part of the stock of off-grade Iron accumulated at one of the furnaces in this vicinity has been disposed of, chiefly to Pipe foundries, at \$13 and upward, at furnace. We continue to quote Standard

to Choice No. 1, \$18 @ \$19.50; No. 2, \$17 @ \$17.50, and Gray Forge nominally \$16 @ \$16.50.

Scotch Pig.—We quote Coltness, \$21, nominally; Shotts, \$20.25 @ \$20.75; Langloan, \$20.25 @ \$20.75, and Dalmellington, \$19.50 @ \$19.75.

Spiegeleisen.—We quote nominally, in the absence of business, \$27 for 20 % Spiegeleisen, and \$54 for 80 % Ferromanganese.

Plates.—During the week a leading Western mill has taken the contract for the Government vessel at an upset price of 2½¢ a pound, this, including Boiler as well as Ship Plates, subject to the rigid Government inspection and long credit. The same concern has secured the Plates for four vessels to be built by Roach, the quantity involved being about 3000 tons. The market has been weak, with concessions being liberally made, and business being sought even by large mills, with small buyers. We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Structural Iron.—The market continues weak on everything, except Beams. It is rumored that a contract for 12,000 tons of elevated work for Brooklyn, the business, however, not going to the two mills which have till now taken the bulk of that class of work in that quarter. We quote Sheared Plates, 2¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.2¢; Angles, 2¢ @ 2.10¢; Tees, 2.5¢ @ 2.6¢, and Channels and Beams, 3.3¢ on dock for all sizes. Foreign Beams are quoted 2.55¢ @ 2.75¢.

Bar Iron.—We quote: Carload lots on dock, half extras, Common; 1.7¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢, and Refined, 1.8¢ @ 2¢.

Merchant Steel.—The market has been completely demoralized by the withdrawal already alluded to of a leading mill from the association. Spring Steel, cut to lengths, has been sold in moderate lots, delivered in this State at 2.25¢, six months flat. The bulk of the Sleigh Shoe contracts for the season were placed before the decline, as well as a great many lots of Tire Steel. Considerable of this business is being readjusted. Steel Shafting has sold at 2¢, delivered in New England, including odd sizes.

Steel Rails.—The situation is not quite clear yet. Eastern mills' sales have been made, aggregating about 8000 tons, the greater part at private terms. Evidence is adduced to show that \$28 is being underbid, and there is good reason to believe that \$27.50 has been done, while the assertion has been made that \$27 would not be rejected. In the West there have been a number of large sales, details of which are withheld. But the market there is still irregular. New quotations of \$26.50 at Pittsburgh have been made, and it is reported on good authority that buyers have been given to understand, in more than one case, by one Western mill that any quotations made in certain territory will be met. Among the contracts known to have been placed are a lot of over 20,000 tons to a Northwestern road, and a lot of 7000 tons to a Kentucky road, and a like amount to a Colorado road. It is certain, however, that for the present at least the low figures quoted some time since, say, \$25 in the West and \$26 in the East, are not being made. There has, therefore, been a clear advance of \$1 @ \$2.50 per ton, according to locality, and a further rise is not improbable.

Old Rails.—No sales of any consequence are reported, the demand and the supply both being light. We quote \$23.25 @ \$23.50 for Tees.

Wire Rods.—The market is dull, with moderate sales of Basic at \$39, and Acid offered at \$38, ex-ship.

Warren, Wood & Co., 115 Broadway, are introducing the Melrose brand made by the Citico Furnace, Chattanooga, to compete with imported Scotch. They submit the following comparative analyses:

	Mel-rose.	Lang-loan.	Carn-brook.	William-son.
Silicon....	1.28	1.23	2.93	2.18
Phosph....	0.81	0.73	1.12	0.85
Sulphur...	0.03	0.02	0.03	0.07
Carbon...	3.38	4.18	3.63	3.46

Changes have taken place in the firm of A. R. Whitney & Co., of this city.

Financial.

General business is expanding in steady volume, and in local trade reports are at least fairly good. The total clearing house exchanges of all the principal cities show an increase of 18 % compared with last year. In New York the increase is 16.8 %, and outside of New York 33 %. At nearly all manufacturing points the improvement is decided. All along the northern lakes and at the Northwest the gain is not less noticeable. At New Orleans and Memphis there is a heavy movement in cotton and the sugar crop is being marketed rapidly. The stimulus in railway transportation arises from important arrangements relative to freight tariffs, the attempt at readjustment having made good progress. A Chicago dispatch says the action of the Central Traffic Association in ordering a restoration of east bound freight rates December 17 to the basis of 25 cents on grain and flour and 30 cents on provisions, from Chicago to New York, has stimulated shipments to an extraordinary extent.

The aggregate for the week was 93,391 tons, against 61,361 tons for the previous week. This, with one exception, is the heaviest week's business in the history of the roads. Corn shipments were particularly heavy. In unison with the above and in accordance with previously received instructions, the Eastern agents of all Southwestern railroads on Saturday put into effect a practical advance from previous rates of 20 to 40 ¢. The advance makes first-class freight \$2.63; second class, \$2.12; third, \$1.78; fourth, \$1.48; fifth, \$1.23; sixth, \$1.19½; seventh, \$1.04½. But it is estimated that these figures are not strictly adhered to. President Depew, speaking for the trunk lines, is quoted as saying: "We are entirely harmonious, and East and West, matters were never in better condition." Nevertheless, the railroad situation is considered complicated, and there are misgivings respecting the permanency of anything that is done. The reassembling of Congress had little effect.

The Stock Exchange markets became almost buoyant when Missouri Pacific decided to advance rates to a paying basis, regardless of what the other roads might do, and on Friday it was announced that a full restoration of west-bound rates had been made. The result was that at Saturday's closing prices nearly the whole of the decline of the 10 days previous had been recovered. For the first time in years Rock Island went below par, touching 97½. A settlement of the Oregon Navigation difficulties was reached by the Union Pacific and Northern Pacific, and these properties closed strong. An unfavorable bank statement and news that at least \$1,000,000 was engaged for export caused general weakness. Lower prices in London, caused by reports of a proposed advance by the Bank of England established lower values on Monday. On Tuesday the movement was irregularly

downward with New England weakest, but in the final dealings there was a rally.

United States bonds are quoted as follows:

U. S. 4½s, 1891, registered.....	108
U. S. 4½s, 1891, coupon.....	108
U. S. 4s, 1897, registered.....	127½
U. S. 4s, 1907, coupon.....	128¾
U. S. currency 6s.....	118

The total amount of bonds purchased to date, under the circular of April 17, is \$99,024,050, of which \$51,396,650 were 4% and \$47,627,400 were 4½%. The cost of these bonds was \$117,450,457, of which \$66,010,877 was paid for the 4% and \$51,439,579 was paid for the 4½%. Maurice L. Muhleman succeeds William Sherer as cashier of the Sub-Treasury in New York City.

The weekly statement of the New York City Associated Banks issued on Saturday showed a loss in surplus reserve of \$2,872,725. The banks now hold \$7,203,825 in excess of legal requirement. The changes in the averages show a decrease in loans of \$2,314,700, a decrease in specie of \$4,449,900, an increase in legal tenders of \$428,300, a decrease in deposits of \$4,595,500, and a decrease in circulation of \$240,900. Money is rather more active, and for time loans there is a fair demand, which is met chiefly by trust companies and out-of-town institutions. Rates on good collaterals are 4% for four months or less and 4 @ 5% for longer dates. Commercial paper is offering more freely, and rates are 4½ @ 5% for 60 @ 90 days. The posted rates for bankers' sterling are \$4.85 @ \$4.85½ for 60-day and \$4.89 for sight. The market is strong and occasions some apprehensions that there may be a loss of specie, which would be ill timed with reference to the annual settlements.

The wheat market is unsettled and dull at the close. Corn dropped 1½¢. Cotton is firm at about 9½¢ for spot. In coffee there is a slump, caused by favorable accounts from Brazil. Sugars are steady but dull. The Hawaiian sugar crop promises to be the largest crop ever gathered, reaching fully 120,000 tons, as compared with 110,000 tons for the past season. In provisions there was a break, caused by a raid in Chicago. Dry goods jobbers report a good inquiry for anything that could be shipped before the 17th inst., when advanced freight rates take effect. In the grocery trade orders from the South are becoming more important, but all sales are on a closer margin.

The imports of merchandise at this port during the week were \$8,553,659, of which amount \$1,676,000 represents dry goods. Since January 1 the total is \$436,314,000, against \$440,952,000 for the same time last year. The total of merchandise landed here last month was \$32,877,955, against \$38,300,880 for November of last year. The exports for the month are a disappointment, the total, exclusive of specie, being \$25,446,574, which is one and a half millions below the corresponding total of last year and over \$3,000,000 less than the same return for 1886. Since January 1 the total exports from New York, exclusive of specie, were \$271,009,000, as compared with \$283,976,000 for 11 months in 1887. For two months the trade of the entire country shows an adverse balance of \$55,000,000.

Metal Market.

Copper.—London has remained unaltered during the entire week so far as Chili Bars are concerned, which remain £77. 10/, spot, and £78, futures, good merchantable brands improving 10/ @ £78, and Best Selected giving way to £80. 10/. Sales have not exceeded 75 tons. Since the pool sale, alluded to in our last report, our own market has exhibited the same listless feeling and inactivity; what

little transpired has been at 17.25¢ to 17.30¢ for Lake, and 16¼¢ for Casting brands. The Anaconda's contract with the syndicate expiring with the current year, it was at first reported that the mine had now already shut down and was to receive \$300,000 monthly for doing nothing till the end of next year, 4¢ @ 1 lb profit having been secured it on a fixed estimated output for remaining idle. This was contradicted from Butte City; it was stated that the mine had shut down temporarily, owing to a strike, and resumed work since, the said strike being at an end. There is an impression, however, that some such arrangement has either been concluded or is still in course of negotiation, and that the statement made had merely leaked out prematurely. The fire in the Calumet and Hecla Mine is said to be diminishing, and that it is believed it will soon be under control; at any rate, not much importance as affecting production seems to attach to it at present. Financial matters at Paris, including Copper shares, begin to look very blue, the Panama Company being in desperate straits, with the shares down from 500, where they formerly stood, to 145, and not a franc to be got except through a Government guarantee, which there is considerable hesitation about. For if France, as a maritime power, is to assume the work of the canal, which it would drift into by any guarantee given, it is to be presumed the Monroe doctrine would prevent the United States from remaining a passive looker-on, and such an eventuality the present weak Government of France is seemingly not prepared to run the risk of. If the Panama Canal Company, is on the other hand, allowed to go to pieces French capitalists, large and small, will have to face a dead loss of 1,000,000,000 francs to begin with, and a financial and political crisis is unavoidable, which could hardly fail to affect the Société des Métaux in its financial arrangements, present and prospective. The export of American Copper the first ten months has been 28,773,591 lb, against 10,552,893 in 1887. Spain exported during the first eight months 569,682 tons of Pyrites, against 535,645 last year and 476,163 in 1886, and 18,443 tons of Precipitate, against 18,519 and 17,781.

Tin.—A decline took place in the London market since our last report from £99. 5/, spot, Straits, to £98. 5/, and futures from £99. 15/ to £98. 15/. Sales, 990 tons. Here the market has been irregular, winding up tamely at 21¼¢ @ 22¢, spot and December, and 21.65¢ @ 22.15¢, January, while in a jobbing way the price is nominally 22¼¢ @ 22½¢ at the close. The import of Tin into the United States the first 10 months has been 27,600,261 lb, against 25,169,673 lb same time last year, while there were re-exported respectively, 118,150 lb and 109,425 lb. **Tin Plates.**—There has only been a moderate demand during the week at a shade lower prices, especially in futures, which are influenced by the decline in Pig Tin. Some orders have been entered in Wales at lower prices, but the bulk of orders are still pending. We quote at the close, large lines, 3 box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; ditto, Coke Finish, \$4.65 @ \$4.70; Ternes, \$4.12½ @ \$4.25; Coke Tins, \$4.22½ @ \$4.30; and Wasters, \$4.12½ @ \$4.15. Cokes are 13/ in Liverpool. The imports into the United States during the first ten months have been 577,556,721 lb, against 545,428,369 same time last year, and the re-export 763,626 lb, against 1,038,462.

Lead.—Has been dull and featureless, sales on the spot being restricted to 200 to 300 tons Common Domestic at 3.75¢ @ 3.80¢, for the most part at the outside figures, the closing quotation also being 3.75¢ @ 3.80¢. At St. Louis the market

is flat at 3.50¢ @ 3.55¢, and at Chicago at 3.50¢ @ 3.60¢. The English market is weak in consequence of bullion from the New World and Australia arriving there more copiously; the London quotation is £12. 15/, Soft Spanish, and £13, English Pig. Spanish exportation during the first eight months has been 88,962 tons, against last year 88,048 tons and 75,126 in 1886.

Spelter.—Only a moderate demand has prevailed on the spot, which has been filled without difficulty at 5¢ @ 5½¢ for Common Domestic, while Silesian cannot be quoted any better than 6¢, nominally, the London quotation being £18. 10/. The Spelter Committee on the Metal Exchange has revised the list of brands desirable on contract by eliminating objectionable ones. The export of Calamine from Spain during the first eight months has been 22,325 tons, against 19,917 tons same time last year and 20,335 in 1886.

Antimony.—Has continued quite active, while the available supply is reduced to a minimum. London cables Hallett higher, £44. 10/ @ £45, and here the same may be quoted 10¼¢ @ 11¢; Cookson, 12¼¢ @ 13¢.

New York Metal Exchange.

The following sales are reported:

THURSDAY, December 6.		
10 tons Tin, February.....	21.75¢	
10 tons Tin, February.....	21.65¢	
FRIDAY, December 7.		
10 tons Tin, February.....	21.85¢	
10 tons Tin, January.....	22.00¢	
10 tons Tin, January.....	22.05¢	
SATURDAY, December 8.		
10 tons Tin, spot.....	22.00¢	
10 tons Tin, February.....	22.25¢	
MONDAY, December 10.		
20 tons Tin, December.....	22.15¢	
10 tons Tin, February.....	22.30¢	
TUESDAY, December 11.		
16 tons Lead, April.....	3.85¢	
16 tons Lead, April.....	3.90¢	

Coal Market.

The Anthracite Coal trade is very dull, and stocks at shipping ports are accumulating, with the effect of softening prices. Even the hard Lehigh fancy brands are in liberal supply, contrary to the usual conditions. Coal men impatiently await the advent of winter weather. Production at the mines, as reported for the week ending December 8, reflects more decidedly the policy of restriction now in force, with the design of imparting steadiness to the market. The total from the three regions is 708,684 tons, a decrease of 72,000 tons compared with the previous week, and 123,000 less than for the week ended a fortnight ago. For the first time this year the total is less than for the corresponding week in 1887. Since January 1 the aggregate is 36,212,747 tons, against 32,816,717 for the same time last year. It is noticed that the shut-down shows conspicuously in Lehigh Valley. A Philadelphia report says: Individual operators in the Wilkesbarre region have been offering all sizes of Coal in that market at a cut of from 15¢ to 20¢ @ ton, shipments Westward via the great lakes having been suspended since the close of navigation. Shipments to tidewater via the canals have also about closed. Navigation on the Lehigh Canal has stopped for the season. The Schuylkill Canal will close on the 15th inst., and the Delaware and Raritan Canal on the 20th, unless closed by ice at an earlier date. Freights from New York to Boston are quoted at \$1.05 @ \$1.25.

Bituminous Coal remains unchanged, and in liberal supply.

The accounts of the shipments of Anthracite Coal over the Reading Railroad for the fiscal year ending November 30 show an aggregate of 7,350,320 tons, against 7,493,301 tons in the fiscal year of 1887.

The Jersey Central, Lehigh Navigation and Reading Railroad companies secured

control of the Lehigh and Hudson River Railroad at the annual election of that company. The new route by the Poughkeepsie bridge will connect the Pennsylvania Coal field more closely with the East.

Several of the big Coal roads propose forming a Coal route through Rochester to Lake Ontario at Charlotte.

The hearing of the E. B. Coxe Lehigh Valley Railroad case by the Interstate Commerce Commission has been postponed until January 25.

Buffalo received by the Erie Canal during the season just closed 298,948,492 lb of Anthracite, against 118,877,035 lb in 1887. The amount of Coal passing through the Sault Ste. Marie Canal this season was 2,135,041 tons, as against 1,352,987 tons last season.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from December 1 to December 6, inclusive, and from January 1 to December 6, inclusive, were as follows:

Iron and Steel.

	Dec. 1. to Dec. 6. Tons.	Jan. 1 to Dec. 6. Tons.
Iron Ore: A. Earnshaw.....	278	8,140
Pig Iron: Crocker Bros.....	402	14,624
G. T. Carter.....	225	1,330
James Williamson & Co.....	200	5,600
G. W. Stetson & Co.....	100	14,450
N. S. Bartlett.....	100	5,400
R. F. Goodwin & Sons.....	100	100
Spiegel Eisen: Crocker Bros.....	542	12,339
J. Abbott & Co.....	30	380
Steel: A. Milne & Co.....	52	1,263
R. H. Wolff & Co.....	45	680
J. J. Thomsen.....	27	27
W. F. Wagner.....	25	1,447
S. Strauss & Son.....	25	25
R. F. Downing & Co.....	23	303 3/4
Vulcan Steel Wire Co.....	12	12
Chas. Huggill.....	11	298 1/4
F. S. Pidditch.....	10	510
Newton & Shipman.....	5	150
C. W. Power.....	3	59
C. F. Baker.....	3	229 1/4
Temple & Lockwood.....	1	23
Steel Rods: Naylor & Co.....	470	19,277
Dana & Co.....	300	6,384
S. A. Galpin.....	250	3,120
R. H. Wolff & Co.....	136	3,936
A. Heyn.....	91	1,703
Cary & Moen.....	49	913
Steel Nail Rods: Naylor & Co.....	103	103
Steel Sheets: M. Strouse & Co.....	25	25
Pierson & Co.....	20	1,086
Steel Plates: Naylor & Co.....	22	273 3/4
A. R. Whitney & Co.....	19	31
Steel Bars: Naylor & Co.....	31	402
Iron: G. Lundberg.....	50	739
A. Milne & Co.....	36	236
Iron Rods: Naylor & Co.....	150	847
Iron Girders: R. F. Downing & Co.....	25	503 1/4
Charcoal Iron: A. Milne & Co.....	5	179
Cotton Ties: Wheelock & B. Bullard & W.....	25	950
	10	1,755

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co.....	12,863	537,289
A. A. Thomsen & Co.....	8,539	152,491
N. L. Cort & Co.....	5,772	111,988
T. B. Coddington & Co.....	5,220	168,207
Bruce & Cook.....	4,178	97,001
Dickerson, Van Dusen & Co.....	4,128	262,609
Pratt Mfg. Company.....	1,730	160,611
R. Crooks & Co.....	1,454	67,267
Jas. Byrne & Son.....	1,290	34,801
Lombard, Ayres & Co.....	1,050	14,165
Merchant & Co.....	853	23,765
E. S. Wheeler & Co.....	785	10,758
Central Stamping Company.....	629	35,449
Hy. Whittemore & Co.....	466	47,892
S. Shepard & Co.....	442	19,471
C. S. Mersick & Co.....	247	6,728
Lalanc & G. Mfg. Co.....	230	5,422
Hibbard, Spencer B. & Co.....	132	132

Metals.

	Pounds.	Pounds.
Tin: Knauth, Nachod & Kuhne.....	22,490	119,126

Hardware, Machinery, &c.

Boker, Hermann & Co., Arms, cs., 3
Dunham, Buckley & Co., Hdw., cs., 2; Needles, cs., 1
Field, Alfred & Co., Mds., cs., 22
Folsom, H. & D., Arms, cs., 6
Graef Cutlery Company, Cutlery, cs., 21
Lau, J. H. & Co., Arms, cs., 5
Schoverling, A., Arms, cs., 6
Schultz, Wm. & Co., Hdw., cs., 7
Sheldon, G. W. & Co., Mach'y, pkgs., 170
Sacks & Richmond, Nails, cks., 11
Ward, J. E. & Co., Mach'y, pkgs., 2
Wiebusch & Hilger, Lim., Hdw., cs., 9; do., cks., 2; Razor Hones, cs., 1
Order: Mach'y, cs., 18

Exports of Metals.

	Dec. 1. to Dec. 6. Pounds.	Jan. 1. to Dec. 6. Pounds.
Copper: J. Abbott & Co.....	13,132,530	4,041,522
Lewisohn Bros.....	2,581,293	6,018,291
F. A. Lomal.....	223,639	112,000
American Metal Company.....	560,000	110,276
G. H. Nichols.....	430,000	224,034
J. Bruce Ismay.....	112,026	1,250
S. Mendel.....	449,881	125,000
Ledoux & Co.....	1,451,130	99,320
Muller, Schall & Co.....	430,000	448,809
Copper Queen Con. M. Com- pany.....	112,000	250,000
J. Kennedy, Tod & Co.....	6,250	51,840
H. Becker & Co.....	51,840	189,984
Orford C. & S. Rtg. Company.....	229,371	4,000
Robt. M. Thompson.....	1,000	37,955,404
Thos. J. Pope, Sons & Co.....	3,021,610	4,964,830
Williams & Terhune.....	337,447	939,800
J. Parsons & Co.....	184,288	722,777
Naylor & Co.....	180,965	41,652
Bridgeport Copper Com- pany.....	224,000	2,472,015
C. Herold.....	224,000	449,024
Phelps Bros.....	224,000	224,000
Burgess & Co.....	27,738	679,312
R. W. Jones.....		
Ladenburg, Thalmann & Co.....		
W. H. Crossman & Bro.....		
R. Crooks & Co.....		
Copper Matte: Williams & Terhune.....		
Lewisohn Bros.....		
American Metal Company.....		
J. Abbott & Co.....		
C. Ledoux & Co.....		
F. W. J. Hurst.....		
G. H. Nichols.....		
H. T. Nichols & Co.....		
Kunhardt & Co.....		
Lead: Joseph Gillet.....		
Sanderson & Son.....		
American Metal Co.....		
Old Copper: Burgess & Co.....		

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper.....	@ \$0.13
Light Copper.....	@ .10
Copper Bottoms.....	@ .10
Brass, Heavy.....	@ .08 1/4
Brass, Light.....	@ .06 1/4
Composition.....	@ .06 1/4
Lead, Heavy.....	@ .03 1/4
Tea Lead.....	@ .05
Old Zinc Cuttings.....	@ .03 1/4
Wrought Iron.....	@ 16.00
Light Iron.....	@ 8.00
Stove Plate Iron.....	@ 9.00
Machinery Iron.....	@ 12.00
Grate Bars.....	@ 6.00
Old Rubber Springs.....	@ .04 1/4
Old Rubber Shoes.....	@ .03 1/4
White No. 1.....	@ .03 1/4
White No. 2.....	@ .01 1/4
Canvas, Linen, No. 1.....	@ .04
Canvas, Cotton, No. 1.....	@ .03 1/4
Canvas, No. 2.....	@ .03 1/4
Seconds.....	@ .01
Soft Woollens.....	@ .07
Mixed Rags.....	@ .02
Gunny Bagging, No. 1.....	@ .02 1/4
Jute Butts.....	@ .02 1/4
Book Stock.....	@ .01 1/4
Newspapers.....	@ .00 1/4
Waste Paper.....	@ .00 1/4
Hemp Twine.....	@ .03
Sisal Baling Rope.....	@ .03 1/4

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, Dec. 12, 1888.

The Block-Tin market has reacted sharply from last week's decline, under the influence of purchases by operators who oversold and found it necessary to cover, in view of the small stocks here. The course of the market has led to a more or less general belief that a revival of speculative demand would bring about a considerable advance. The high rates for money check outside speculation, however, and now that the "short" interest is well covered up prices have shown a tendency to decline again.

Copper speculation has been spiritless, and the syndicate agents are the only buyers who manifest the slightest confidence in the market. Outside "short" selling, as well as buying, is on a very limited scale, and the purchases by consumers are diminishing rather than improving. Standing orders given by the syndicate to

buy prompts at £77. 10 and futures at £78 serve to sustain the market. It is the fact, however, that while the prices of Bars are maintained, the market for manufactured Copper is in poor shape. Sales have been made at £4 under prices fixed by the syndicate, and even at that concession the volume of business is unsatisfactory.

Tin Plate business has been moderate and at somewhat variable prices. Very little change is apparent in the rates for prompt deliveries, but orders have been taken for January and February at a decline from previous prices. The production continues to be on a large scale, and the report has circulation that two more new works have been projected. The exports to the United States last month were 24,000 tons, or about the same as those of October. The total for the past 11 months is about 270,600 tons, against 252,500 tons for the corresponding period last year.

Pig-Iron warrants have declined a trifle under the influence of realizations caused mainly by the high rates current for money. Additional furnaces are blowing out because of difficulties as to fuel, &c., and that fact operates in a measure to offset the unfavorable influences. The demand for consumption and export, however, is not very brisk at the moment. Makers' brands of Scotch are held firmly, as is also Middlesboro' Pig, while Hematites have ruled strong on continued active demand from consumers. The exports of Pig Iron to the United States last month were 14,000 tons, making a total of 138,000 tons since January 1, against 375,000 tons for the corresponding period last year.

The Finished Steel and Iron departments continue active to a degree that is much in contrast with the customary experience at this period of the year. Nearly all works in the various sections have liberal orders in hand and old plant is being brought into use. The large capacity, however, leads to competition that prevents prices from advancing a great deal. Among important contracts placed the past week were 14,000 tons Steel Rails with the Ebbwvale Company and a similar quantity with the Cockerill Company. Prices for Rails are fully 1/3 higher than a week ago, so fully are the mills employed, but Billets and Slabs could doubtless be bought at some concession on the nominal prices. Manufacturers are offering Wire Rods at 5/ decline from the prices they have asked previously this month.

The demand for Old Iron Rails, Scrap Iron, &c., has fallen off somewhat and prices for the same are scarcely as firm as they were a week or ten days ago.

Scotch Pig.—There has been a fair business and prices for all branches are firm. Glasgow freights are a trifle lower.

No. 1 Coltness, f.o.b. Glasgow.....	50/6
No. 1 Summerlee, ".....	50/
No. 1 Gartsherrie, ".....	48/6
No. 1 Langloan, ".....	50/
No. 1 Cambro, ".....	44/6
No. 1 Shotts, " at Leith.....	49/6
No. 1 Glengarnock, " Ardrossan.....	48/
No. 1 Dalmellington, ".....	43/6
No. 1 Eglinton, ".....	42/6
Steamer freights, Glasgow to New York, 3/.	
Liverpool to New York, 10/.	

Cleveland Pig.—The market has been fairly active and prices are firmer. No. 1 Middlesboro', G. M. B., 36/6; No. 3 do., 34/.

Bessemer Pig.—There has been a large business and sales are reported at 6d rise. West Coast brands, mixed numbers, 45/, f.o.b. shipping point.

Spiegeleisen.—The output is closely taken up and prices remain firm. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—Business continues brisk and the market strong, with prices somewhat higher. English sections quoted at £4, and light sections £4. 2/6 @ £4. 12/6, f.o.b. at N. W. England shipping point.

Steel Blooms.—There is but little doing in these. We quote £3. 18/9 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—A good business reported, but at somewhat irregular prices. Bessemer, 2½ x 2½ inch, £4. 1/3, f.o.b. at N. W. England shipping point.

Steel Slabs.—Demand fairly active and prices steady. Bessemer, £3. 18/9, f.o.b. at N. W. England shipping point.

Old Rails.—Trade rather slow at the moment and prices a shade easier. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 7/6 @ £3. 10, c.i.f. New York.

Scrap Iron.—A moderate business and prices barely steady. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—Small sales making at about former prices. Bessemer quoted £2. 7/6 @ £2. 10/, f.o.b.

Tin Plate.—A fair trade in Cokes for future delivery at variable prices. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade.....	15/3 @ 15/6
IC Bessemer steel, Coke finish.....	@ 13/6
IC Siemens.....	@ 13/6
IC Coke, B. V. grade.....	13/ @ 13/3
Charcoal Terne, Dean grade.....	12/ @ 12/3

Manufactured Iron.—The market remains firm, and business is still of good volume. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars.....	£ s. d. @ 8 2 6
Common.....	@ 5 10 0
Staff. Bk Sheet, singles.....	@ 7 10 0
Welsh Bars (f.o.b. Wales).....	5 0 0 @ 5 2 6

Tin.—After advancing on covering of "short" sales the market is dull and rather weak. Straits quoted at £98. 5/ @ £98. 10/, spot, and £98. 15/ @ £99 for three months' futures.

Copper.—Trade slow and prices unchanged, except for Best Selected English. Chili Bars, £77. 10/, spot, and £78 three months' futures. Best Selected, £80.

Lead.—The demand slow and prices rather weaker. Soft Spanish, £12. 15.

Spelter.—Business smaller this week, but prices fairly steady. Silesian, ordinary, £18. 10/.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira.....	19.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Milreis (Portugal).....	\$1.08.
Milreis (Brazil).....	54.4
Mark (Germany).....	25.8
	Pounds.
Kilogram.....	2.205
Picul.....	134.

EAST INDIES

SINGAPORE, December 5, 1888.—*Tin*.—Shipments from the Straits Settlements to the United States during November have amounted to 450 tons, against 50 last year, and to England 1200, against 2250; since January 1 they were respectively 3400, against 4150, and 16,500 against 14,750, making a total during 11 months of 20,500 tons this year, against 18,900 last year, which is an increase of 1400 tons, or about 7 % cent.—*Gilfillan, Wood & Co., per cable to their agent, Mr. Charles Nordhaus, 89 Water street, New York.*

MANILA, December 3, 1888.—*Hemp*.—There has been hardly anything done, and the price is nominally \$11.62½ ¢ picul, against \$9.25 same time last year, equaling cost and freight, ¢ ton £40. 7/6, against £32. 16/6. There cleared for the United States since last cable 7000 bales, against none last year; since January 1 229,000 bales, against 238,000; loading for do., 22,000, against 14,000; cleared for England since January 1 325,000, against 4000; loading for do., 8000, against 4000; cleared for all other ports, 66,000, against 42,000; receipts at all ports since last cable, 8000, against 5000; since January 1, 608,000, against 501,000, and 372,000 in 1886. *Freight*, \$7, against \$5.50. *Exchange*, 3/7½, against 3/8.—*Ker & Co., per cable to their agent, Mr. Charles Nordhaus, New York.*

COLOMBO, CEYLON, October 25, 1888.—*Plumbago*.—The market has been quiet during the week at steady rates, the quotations being, in rupees, ¢ ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust 40 @ 65. Following have been the shipments since October 1: To England, 8806 cwt.; to Hamburg, 851, and to the United States 2380—together, 12,037, against last year 6312; 31,840 in 1886, and 18,152 in 1885. *Coir Yarn*.—Nos. 1 to 4, 7 @ 12 rupees ¢ cwt. *Exchange*.—Six months' sight, 1/5 1-16.—*Volkart Brothers, through John W. Greene, 82 Wall street, New York.*

SPAIN

BILBAO, November 24, 1888.—*Iron Ore*.—Some inquiry has been noticeable, and several transactions have taken place, chiefly in Rubios, at rather irregular and slightly easier figures, the closing quotation for the same being 6/10 @ 7/3, and for good Campanil 8/3 @ 8/6, a few cargoes bringing either above or under these rates. More would have been done but for the scarcity of steamers. As in several Baltic ports navigation has meanwhile closed, greater animation may soon arise from increased tonnage seeking cargo. Total shipments to date sum up 3,264,963 tons, against 3,857,087 last year. *Pig Iron*.—Coastwise some 2056 tons were shipped, and to Ancona, in Italy, 1753.—*Bilbao Marítimo y Comercial.*

BELGIUM.

BRUSSELS, December 1, 1888.—*Iron*.—Our market has been steady; there has been some buying of Pig for account of rolling mills in Luxembourg, supposed to have been at 4 @ 4.2 francs ¢ 100 kg., at the blast furnaces, the former equaling 5.10 francs at the rolling mills. Luxembourg, on the other hand, has not yet recommenced selling Pig Iron at Belgium on a larger scale, except in cases in which stocks had accumulated at the furnaces, there being too good a market for Luxembourg Pig in Germany, where it is paid 4.60 francs at present. The German market is for some time past, however, a most fluctuating one, hence anomalies of the kind will occur. News about the Beam market is of a contradictory nature. It is asserted that a syndicate of makers is on the eve of formation in Northern France to uphold prices in that country, which, if true, would be good for ours who have frequently had to suffer from French competition. Thus not long ago a lot of Beams was sold at 11 francs ¢ 100 kg., free on board, at Antwerp, which would have been the extreme minimum figure in Belgium for Domestic Beams. On the other hand, we are told that the Belgian firm of Halot, Louvain, which quite recently secured the big job of building the La Plata bonded workhouses at Buenos Ayres, has bought 5000 tons Steel Beams of the Rothe Erde German Works superior in quality to ours, the latter making a specialty of the same. The fact is that Steel Beams will bring about a revolution in Belgian industry quite as much as Steel Rails did. In order to confront the crisis our works made large Beams a sort of monopoly, and held their ground; the case alluded to will serve as a hint to them. Still, the superseding of Iron by Steel does not take place in an alarming manner yet; thus we still succeeded in exporting during the first nine months 210,000 tons of Finished Iron, against 80,000 tons Steel, the former showing a slight decrease as compared with last year, and the latter an increase.—*Moniteur des Intérêts Matériels.*

Oliver's oat meal mill, in Chicago, was torn to pieces by a violent explosion on Tuesday morning, and three workmen were killed. Buildings in the vicinity were wrecked. This is the second mill of the kind burned in Chicago recently, and a distillery in that city having been destroyed by dynamite a few days ago, opinions differ respecting the cause of the explosion. Mr. Oliver rejects the meal-dust theory.

The American Institute Fair will close on Saturday evening.

The Charcoal Iron Workers.

Last week the United States Association of Charcoal Iron Workers held its ninth annual meeting in this city, the proceedings being opened with a business session on the 5th inst., after which the members partook of an elaborate dinner on board of the Noordland. Tuesday morning was devoted to a business session, at which the following officers were elected:

President: Irving M. Bean, Milwaukee, Wis.

Vice-Presidents: H. R. Stoughton, Shelby Iron Works, Alabama; Geo. B. Wiestling, Mont Alto, Pa.; J. S. Van Alstyne, Wyandotte, Mich.

Secretary and Treasurer: John Birkinbine, Philadelphia.

Board of Managers: J. D. Potts, Philadelphia; J. C. Fuller, Pine Grove Furnace, Pa.; George M. McCauley, Harrisburg, Pa.; L. Heber Smith, Joanna, Pa.; A. G. Curtin, Jr., Roland, Pa.; R. H. Lee, Lewistown, Pa.; John Birkinbine, Philadelphia; Percy Warner, Warner, Tenn.; Dr. H. M. Pierce, Nashville, Tenn.; Chas. H. Brown, Knoxville, Tenn.; W. H. Rood, Ishpeming, Mich.; J. A. Mathieu, Detroit, Mich.; H. H. Noble, Elk Rapids, Mich.; F. P. Miles, Copake Iron Works, N. Y.; M. Lyman, Waverly, N. Y.; Walter Crafts, Columbia, Ohio; W. N. McGugin, Olive Furnace, Ohio; E. S. Noble, Anniston, Ala.; Willard Warner, Nashville, Tenn.; H. A. Crawford, St. Louis, Mo.; W. H. Lee, St. Louis, Mo.; O. D. Case, Hartford, Conn.; M. B. Richardson, Lime Rock, Conn.; M. Hogland, Rockaway, N. J.; M. R. Hunt, Ashland, Wis.; C. E. Coffin, Muirkirk, Md.; George G. Lobdell, Wilmington, Del.; E. W. Crichton, Oswego, Ore.; Jacob Wissler, Max Meadows, Va.; E. Sjosdadt, Katahdin, Me.

The following Executive Committee was appointed: Joseph D. Potts; J. C. Fuller, George G. Lobdell.

The meeting passed the following resolutions:

Resolved, That the Executive Committee be requested to present to the association a revision of the constitution, and also to consider and report upon any suggestions for reorganization.

Resolved, That a committee of five be appointed, with power to add to their number, to memorialize Congress, urging that such action be taken in regard to our tariff laws or custom duties as will more perfectly encourage and protect the manufacturers in the United States of the various products in which the membership of the association is interested.

In the afternoon, by invitation, the members and their ladies visited Edison's Laboratory, at Llewellyn Park, where an elaborate exhibition of the wonders of the phonograph were given, and the workings of the magnetic separator were inspected.

A toothpick factory is one of the flourishing woodworking establishments of Harbor Springs, Mich. White birch is exclusively used in the manufacture of the toothpicks, and about 7,500,000 of the little splinters are turned out daily. The logs are sawed up into bolts each 28 inches in length, then thoroughly steamed and cut up into veneer. The veneer is cut into long ribbons 3 inches in width, and these ribbons, eight or ten at a time, are run through the toothpick machinery, coming out at the other end, the perfect pieces falling into one basket, the broken pieces and refuse falling into another. The picks are packed into boxes, 1500 in a box, and are then put into cases, and finally into big boxes, ready for shipment to all parts of the world.

The new Chicago and Northwestern Railroad bridge across the Missouri River was formally opened to traffic, 6th inst. The bridge cost \$1,500,000.

Hardware.

With the close of the year there is a falling off in the volume of business and in most lines there is comparatively little doing. It is not the season when manufacturers usually announce changes in price, but in a number of lines there are indications of somewhat lower quotations than have prevailed. Jobbers and manufacturers who are still making active efforts to market their goods are showing a disposition to make concessions to induce purchases, and some of the Western houses are quoting exceptionally low prices. The outlook for a satisfactory trade with the opening of the next season continues good.

Barb Wire.

The New York market is characterized by a limited demand, but prices within the territory covered by the agreement between the Eastern manufacturers are well maintained, quotations being as follows: Galvanized Four-Point 3.6 cents in carload lots; 3-ton lots 3.7 cents, and small lots 3.9 cents.

Cut Nails.

New York sellers agree in reporting a better volume of business thus far this month than they did in November, a favorable sign, considering that we have entered the dull season of the year. Prices remain at \$1.80 @ \$1.90 for carload lots on dock. The meeting at Wheeling yesterday has no special significance to the Eastern trade, because the Western mills have not been sellers in this market to any extent for some time past. It is of interest, however, as showing that the makers of the Ohio Valley, including 14 large mills who can sway the Western trade, have at last grown tired of the demoralized condition of the trade. The Eastern makers hold a meeting here tomorrow, the first for a long time.

We have received the following dispatch from Wheeling: An adjourned meeting of the Cut Nail manufacturers of the Ohio Valley, including 14 mills, was held at the office of the Benwood Company, at Wheeling, yesterday. The pooling scheme was abandoned, the Western firms declining to agree to it. The Western Cut Nail Association was organized, J. N. Vance being elected president and Edward Hazlett secretary. A \$1.90 card was adopted, with the usual discounts. The opinion prevails that the influence of the new association upon the market will not amount to much.

Miscellaneous Prices.

The Fork and Hoe Makers' Union held a meeting in Cleveland on the 5th inst. There was a large attendance and the reports of orders in hand were very satisfactory, showing that nearly all the makers present had sold up to their allotments. The union, as an organization, did not take any action on prices, but most of the members independently agreed to advance prices 5 per cent., making the regular discount 65 per cent., instead of 65 and 5 per cent., as heretofore. These indications point, it will be observed, to a strong and satisfactory condition, and the combination is regarded by the trade as in excellent condition.

The market on Pistols is in a more satisfactory condition than recently prevailed, there having been a recovery from the exceedingly low prices lately ruling. The manufacturers of both Bull Dogs and Double-Action Revolvers are holding the goods firmly at the advanced prices, and it is thought very probable that there will

before long be a further advance. It is intimated that the delay in announcing such advanced prices has been to give parties holding the goods purchased at low figures an opportunity to dispose of them, with a view to avoiding disturbance of the market by the offering of these goods at irregular prices.

An advance was announced by the Cordage manufacturers December 6 on both Manila and Sisal Rope, the quotations for which are as follows, subject to a discount of 1 1/4 per cent. for cash in 10 days:

Manila, 1/2 inch and larger.....	12 3/4	cents per lb
Manila, 1/2 inch.....	13 1/4	" "
Manila, 1/2 and 5-16 inch.....	13 1/4	" "
Manila Tarred Rope.....	12 1/4	" "
Manila Hay Rope.....	12 1/4	" "
Sisal, 1/2 inch and larger.....	10 3/4	" "
Sisal, 1/2 inch.....	11 1/4	" "
Sisal, 1/2 and 5-16 inch.....	11 1/4	" "
Sisal Hay Rope.....	10 3/4	" "
Sisal Tarred Rope.....	10 3/4	" "
Sisal Medium Lath Yarn.....	9 1/4	" "

The market is regarded as very firm, this advance having been caused by increased prices for Hemp, both Manila and Sisal, and also by a shortness of the supply. The market is active, Binder Twine being especially so, in the production of which the manufacturers are running to their fullest capacity.

The following is the price list of the Freeport Hardware Mfg. Co., Freeport, Ill., for their line of Spring Hinges and Door Springs. It is subject to a discount of 40 per cent., f.o.b. cars Freeport, Ill.:

	Per gross pair.
Wiles' No. 1 Spring Hinges.....	\$34
Wiles' No. 2.....	30
Devore No. 1.....	30
Devore No. 2.....	26
Devore No. 3.....	22 (Blind Hinges)
Rex Spring Hinges (3 x 3 Covered Coil).....	32
Devore No. 1 Door Springs, per gross.....	15

James F. Brook Rubber Company, Trenton, N. J., issue a sheet of quotations on Belting, Hose, Packing, &c.

Wire Goods Company, Worcester, Mass., have issued the following discount sheet applying to their catalogue, December, 1888:

	Discount per cent.
Bright Wire Goods.....	85
Mill Wire Goods.....	40&5
Wire "S" Hooks.....	55&10
Belt Hooks.....	75&10
Spring Cotters.....	60&10
Cary's Wardrobe Hooks.....	60&10
Cary's Shutter Knobs.....	60&10
Umbrella Racks.....	25
Towel Brackets.....	70&10
Splash Holders.....	70
Coat and Garment Hangers.....	50
Telegraph and Desk Hooks.....	70&10
Kitchen Hooks.....	70&10
Regalia and Hat Pins.....	70&10
Steel Wardrobe Hooks.....	70&10
Brass Wardrobe Hooks.....	70&10
Brass Coat and Hat Hooks.....	70&10
Picture or Mirror Hooks.....	70&10
Screw Hooks, No. 1412.....	75, 10&10
Cup Hooks, No. 181.....	75, 10&10
Tassel Hooks.....	70&10
Braced Screw or Chandelier Hooks.....	50&10
Bird Cage Hooks.....	60, 10&10
Chandelier Hooks, No. 410.....	60&10
Chandelier Hooks, No. 510.....	70&10
Brass Line Cleats.....	60&10
Malleable Line Cleats.....	60&10
Cast-Iron Line Cleats.....	60&10
Agate Spinner.....	60
Iron Hooks and Eyes.....	70
Brass Hooks and Pins.....	60&10
" Hooks and Eyes.....	60&10
Wrought "S" Hooks.....	80&10
Hitching and Hammock Rings.....	70
Hitching Eyes.....	80
Locker or Shutter Rings.....	80
Stable or Hitching Rings.....	70
Hitching Rings.....	70
Hand-Rail Screws.....	70
Rail Dowels.....	70
Eye Bolts.....	60, 10&10
Wrought Screw Hooks.....	60, 10&10
Eye or Swing Bolts.....	70
Well-Wheel Hooks.....	70
Hammock Hooks.....	60, 10&10
Universal Chain.....	5
Catt e Leaders.....	70
Clothes Line Wire.....	45&5

Wire on Spools (1 ounce spools):

Annealed Steel.....	35&2
Tinned Steel.....	35&2
Soft Copper.....	25
Wax Flower or Hair Wire.....	35&2
Bright and Annealed Wire on Spools.....	35&2
Annealed Tin Wire on Spools.....	35&2
Pure Soft Copper Wire on Spools.....	25
Picture Cord.....	60&5
Curtain Pole Brackets.....	50
Patent Extension Sling.....	75
Iron Pokers, No. 1.....	50
Ring Pokers, Nos. 11 to 121.....	40
Wood Handle Stove Pokers.....	40
Stove Flue Scrapers.....	40
Stove Cover Lifters.....	40
Corn Beef or Brine Hooks.....	50
Wire Meat Hooks, Nos. 43, 44 and 45.....	80&10
Meat Hooks.....	80&10
Finger Nail Trimmers.....	30&10
Elastic Steel Door Mats.....	25
Wire Twine Boxes.....	40
Wire Puzzles.....	60
Package Handles.....	15
Suspension Rings.....	25
Improved Wrought Staples.....	80&10
Steel Hooks and Staples.....	80&10
Steel Rings and Staples.....	80&10
Wrought Rings.....	80&10
Wrought Hinge Nails.....	75&10
Corrugated Broilers.....	70
Standard Broilers.....	60
Twisted Handle Broilers.....	50&10
Hotel Broilers No. 74.....	70
Riveted Hotel Broilers No. 204.....	60
Oyster Broilers.....	65
Bread Toasters.....	80&10
Pot Cleaners.....	60
Glove Pot Cleaners.....	60
Dish Cloth Holders.....	50
Saratoga Potato Fryer.....	37 1/2
Vegetable Boilers.....	50
Meat Rests.....	50
Dish Drainers.....	50
Cross Toasters.....	50
Vegetable Skimmers.....	30&5
Vegetable Lifters.....	30&5
Potato Mashers.....	50
Kitchen Forks.....	50
Paper Racks.....	10
Spiral Egg Beaters.....	65
Spoon Egg Beaters.....	50
French Egg Whips.....	40
Baker's Egg Whips.....	40
Stove-Pipe Shelves.....	30&10
Egg Boilers.....	40&10
Sponge Baskets.....	50
Sponge Baskets, Light Pattern.....	50
Hair-Brush Holders.....	50
Tea and Coffee Pot Stands.....	50&10
Pie-Plate Stands.....	50
Table Mats.....	50
Soap Dishes.....	60
Soap Brackets.....	60
Shirt Rests.....	50
Picture Easels.....	40
Cup and Saucer Easels.....	40
Plate Easels.....	40
Plaque Easels.....	25
Card Receivers.....	15
Millinery Stands.....	25
Fancy Baskets 336 and 338.....	25
Fancy Wire Baskets 340 to 342.....	25
Tea or Coffee Strainers.....	60&10
Black Handled Strainers 709 add 710.....	37 1/2
Black Handled Strainers 698 to 702.....	50&10
Wire Handled Strainers 704 to 708.....	50&10
Bowl Strainers 712 to 714.....	50
Bowl Strainers 716.....	40
Globe Rat Traps.....	50
Combined Rat and Mouse Traps.....	40
Rat Traps.....	40&5
Animal Traps.....	50
Toy Mouse Traps.....	40
Dome Mouse Traps.....	40
Wire Dish Covers.....	50&10
Dish Covers (extra size).....	30&10
Ox Muzzles, Light Pattern.....	50
Improved Ox Muzzles.....	40&10
Horse Muzzles.....	37 1/2
Double Pointed Tacks (in papers).....	80
Double Pointed Tacks (in bulk).....	60
Clamp Staples No. 5 (in papers).....	50
Clamp Staples No. 5 (in bulk).....	50
Casket and Hoop Staples.....	60, 10&10
Butter or Tobacco Tub Staples.....	60, 10&10
Copper Nail Staples.....	15
Rattan and Willow Staples.....	50
Shade Tacks (in papers).....	60
Shade Tacks (in bulk).....	50&10
Lightning Belt Fasteners.....	40&10
Norway Clinch Staples.....	60, 10&10
Steel Spring Staples.....	60, 10&10
Electricians' Staples.....	40&10
Bed-Spring Staples.....	60, 10&10
Blind Staples.....	70
Hinge Staples.....	60&10
Poultry-Net Staples.....	60&10
Speaking-Tube Staples.....	60&10
Steel-Wire Carpet Tacks (in papers).....	50&10
Steel-Wire Carpet Tacks (in bulk).....	50&10
Copper and Brass Tacks (in papers).....	50
Copper and Brass Tacks (in bulk).....	50
Iron Escutcheon Pins.....	50&10
Brass Escutcheon Pins.....	55&10

Steel-Wire Trunk Nails.....	60
Copper & Brass Finishing Nails.....	50
Spiral-Grooved Box Nails.....	60
Solomon Gundy Nail Box.....	40&10
Nail Keg and Store Truck.....	40

Butterfield & Co., Derby Line, Vt., write us that during the past year they have made extensive additions to their plant and are again in the market with a full line of Blacksmiths' Stocks and Dies and Taps. They also issue a new illustrated catalogue in which these goods are shown. They advise us that the price on their Blacksmiths' Goods is from discount 30 and 5 to 30 and 10 per cent., the price on Reece's new Screw Plates being from discount 33½ and 5 per cent. to 40 per cent.

It is to be noticed that the prices of Brass and Copper goods are not as firmly maintained as would be supposed from the condition of the market in the raw material. Difficulty is found in holding these prices up to a normal level, and they are recently giving increased evidences of weakness.

There has been no change in Shot, notwithstanding the condition of the Lead market. Prices are regarded as low, and it is thought probable that an advance will soon be announced.

The present season has been an exceptionally satisfactory one for Skate manufacturers, and some of them are referring to their inability to supply the goods with sufficient promptness to meet the requirements of the trade, some of whom are annoyed at not having their orders executed in time for the opening of the season.

Items.

Buhl, Sons & Co., Detroit, Mich., are issuing a new illustrated catalogue which will take its place among the most complete and satisfactory. It is a noble volume of 1206 pages, which are filled with information relating to a very extensive assortment of Hardware and its related lines. The volume is fully illustrated with excellent representations of the different goods, and presents the goods in a systematic and compact arrangement. The catalogue opens with Metals, Iron, Nails, &c., and ends with Guns, Fishing Tackle and Sporting Goods, all the regular departments of Hardware being represented, with many related lines, including Tinner's and Blacksmiths' Tools, Household Specialties, Cutlery, &c. More than 5000 illustrations are given in the book. It has an exceptionally complete index, the extent of which may be inferred from the fact that 26 three-column pages are devoted to it. It is also to be observed that only such goods as are carried in stock are catalogued. In the introductory circular to their customers it is announced that their business was established in 1855. In 1865 they began the manufacture of Pig, Bar and Sheet Iron, Nails, &c., at Sharon, Pa., where they employ 1200 men. They state that they use in their mills only the best materials and turn out a product of exceptional quality. No discount sheet is issued by the house, but as values are constantly fluctuating they will quote prices on application. It is their aim to fill all orders on the day received and to give the trade the benefit of the lowest prices ruling on the day of shipment. This catalogue will be an important addition to Hardware literature and will doubtless be appreciated by those who are favored with it, and it cannot fail to be of service to the enterprising house which has issued it in still further enlarging their extensive business.

Freeman Wire Company, St. Louis, Mo., have issued a handsome catalogue which illustrates their goods. It relates to Plain and Barbed Fence Wire, Staples,

&c., and a large variety of Ornamental and Plain Wire and Ironwork, including Bank and Office Railings, Sand, Coal and Ore Screens, Store Fixtures, Flower Pot Stands, Wire Signs, Stable Fixtures, Window Guards, Elevator Enclosures, Crestings and Finials, Iron and Wire Fences, &c. The plant of the company consists of the Wire Mills at East St. Louis, Ill., where they manufacture Iron and Steel Wire, Galvanized, Bright, Tinned, Coppered and Annealed, and all kinds of Plain and Barbed Fence Wire, and of the Wire and Ironworks at 410 North Main street, St. Louis, which are referred to as fitted with complete appliances and machinery for the manufacture of artistic Wire and Ironwork; 106 pages are used in displaying this line of goods, of which, in connection with the cuts, list prices and descriptive matter are given.

The New Haven Wire Goods Company, New Haven, Conn., whose Broiler and Toaster is described on page 917, besides their agencies in Boston, New York and Philadelphia, are represented in the West by Sidney Shepard & Co., Buffalo, N. Y.; the George Worthington Company, Cleveland, Ohio; Standart Bros., Detroit, Mich.; C. Sidney Shepard & Co., Chicago, Ill., and F. A. Lawson & Co., Cincinnati, Ohio.

Montgomery & Co., 105 Fulton street, New York, have lately been appointed agents for the sale of H. H. Barton's Emery Paper, Emery Cloth and Sandpaper in this city. We are advised that the Thrift File Works, of Philadelphia, have also appointed them their agents for New York and the New England States.

The Pittsburgh Tuiere Works, manufacturers of Wrought Copper and Bronze Tuyeres, Coolers and Bosh Plates and Brass and Bronze Castings, Pittsburgh, Pa., have removed their office and works to 83-95 Main street, Allegheny, where they are prepared to fill orders promptly, as heretofore.

It will be observed that among the special announcements on page 50 the Lloyd & Supplee Hardware Company, Philadelphia, Pa., advertise for a salesman with established trade in Western and Southern Pennsylvania. The influential position occupied by this house will doubtless attract attention to this announcement from any Hardware salesmen who are open to accept such an engagement.

James L. Haven Company, Cincinnati, Ohio, have issued their illustrated catalogue No. 15. It comprises illustrations and prices of a large variety of goods, including Shutter, Gate and Spring Hinges, Axle Pulleys, Barn Door Rollers, Grindstone Fixtures, Clamps, Jack Screws, Casters, Bed Fasts, Drills, Tire Benders, Repair Links, Pump Curbs, Meat Cutters, Standard Mills, Agricultural Implements, &c. It is accompanied by a discount sheet of 16 pages in which list prices and discounts are given on this line of goods.

Champion Lawn Rake Company, Canton, Ohio, issue a neat catalogue, in which they describe the different patterns of Lawn Rakes manufactured by them. They include the Champion Steel Lawn Rake, reversible handle, the Champion Reversible Lawn Rake, the Champion Lawn Rake and the Champion Garden Rake.

Fowler & Sons, Buffalo, N. Y., issue a variety of circulars and lists referring to the different departments of their business. They relate to Iron and Steel, their wood-working department, to which a pamphlet of 32 pages is fully devoted; their Trimming, Paint and Varnish department, to which is devoted a pamphlet of 62 pages, covering an assortment of goods in the line indicated, while another relates to the Anderson Bolt Works, Anderson, Ind., of which they are the proprietors. This

gives the standard lists on Common Carriage Bolts, Machine Bolts, Lag Screws, &c., and Square and Hexagon Nuts.

Chadborn & Coldwell Mfg. Company, Newburgh, N. Y., have prepared an exceptionally neat and attractive blotter pad, which is intended to be of use to their customers and also to call attention to their line of Lawn Mowers. The cover of this pad is celluloid, artistically printed in four colors, and under it are half a dozen sheets of blotting paper attached at one end, on each of which is mentioned some point on which they lay emphasis concerning their line of Mowers. The novelty of this device and the attractiveness in which it is gotten up entitle it to special attention.

We desire to call attention to the advertisement of the National Keg and Box Company, Birmingham, Conn., page 50, who advise us that they have extensive mills and facilities for supplying Kegs and Locked Corner Boxes of all kinds to take the place of pasteboard boxes. They also manufacture Hardwood Boxes and Packing Cases.

Chieftain Hay Rake Company, Canton, Ohio, issue a neat pamphlet relating to their Hardware specialties. Post-Hole Diggers are given a prominent place, the Little Giant, Hercules, Scheidler and the New Champion being represented. Portable Tree Protectors, Extension Step-Ladder and the Boys' Tricycle are also shown. The company warn the trade against infringements on their patents for Post-Hole Diggers.

The Avery Elevator Bucket Company, Cleveland, Ohio, announce, December 9, that owing to the extension of their line of manufacture they have decided to change their corporate name to the Avery Stamping Company. They will still continue to make their patent Seamless Steel Elevator Buckets a prominent feature of their business, and, when they are settled in their extensive new works, which, it is expected, will be about December 20, they state they will be prepared to do the most intricate stamping and shaping of metals ever attempted in any country.

A. J. Phillips & Sons, Fenton, Mich., manufacturers of the Bonanza Window Screen, described on page, 918 in addition to their line of Snow Shovels, are also manufacturing the Phillips Adjustable Window Screen Frame, which, they advise us, was satisfactorily tested during the past season by a portion of their trade, and is now offered to the general trade, a large stock being in process of construction. The Frame has wood corner brackets, the sides of which have dove-tail grooves into which slide and engage the dove-tail tongues on the side sticks, and it is pointed out that the dealer or consumer can thus make his own Frame and be sure of securing a fit, as well as a strong and attractive article. The point is specially made that the Frame can be adjusted to any size after it is put together. They are furnished with moldings to cover the edge of the wire cloth and slides for attaching to the window cases. They are made in imitation walnut and in natural red oak.

Trade.

Our Louisville advices, under date December 8, are as follows:

The Hardware trade of Louisville, Ky., is undergoing a steady improvement, both as to value and prices. Those jobbers who had dull business last week feel good over this week's returns. The country is evidently settling down to a fair winter's trade, although the season is quite backward for such goods as enter into cold weather sports. Ammunition continues to go out in large quantities, and Shelf goods are moving satisfactorily. The open winter has the effect of enabling building and improvements, generally, to go on later than usual; this is marked in the sales of Barb

Wire, which, coupled with extremely low prices, enables the country merchant to buy in carload lots, whose wants are usually a few tons at a time. The same conditions govern the trade in Cut Nails, there rarely ever occurring such a large December movement in this staple. The trade hails with joy and yet misgiving the announcement of the promised action of the Nail mills. Wire Nails are still firm, with some large orders offering and looking for a weak-kneed manufacturer. Bar Iron is stiffening from store under strong inquiries for heavy goods; this will probably be followed soon by withdrawals of extreme prices by the mills. One feature that retards trade to a certain extent is that the Tobacco crop of this State and Tennessee has proved to be an enormous one, and well cured, but, because of the great amount grown, prices have dropped so low that it will hardly pay the farmers the expenses of shipping to market. In this way untold thousands of dollars are compelled to lie idle in the curing barns and country warehouses. Lumber coming from Western Kentucky and Tennessee is in such increasing demand, both domestic and foreign, that new saw mills are being set up at all available points on the railroads and streams traversing those sections, and are doing a rushing business. This means prosperity for the manufacturers of such machinery. The hard woods, particularly the white oak, coming from this region, are highly valued both in this country and in Europe. The lands through which the Tennessee Midland is to run have increased in value several times over, being heavily timbered with uncultured virgin forests.

From Dudley Bros. & Lipscomb, Nashville, Tenn., we have the following advices:

Volume of business has been fully as good the past fall as any season heretofore, and notwithstanding the yellow fever and the political excitement we have fully held our own. Crops were extraordinarily fine in growing, but the prospect was considerably marred by continued rains. A large quantity of the corn is still in the fields and much of it has rotted, and cotton picking will not be more than finished in time for planting the new crop; but on the whole enough will probably be saved all right to make business keep up. Prices continue very low, notwithstanding the result of the election. Wire Nails, Shot and other kindred staples are cheaper than ever before. Bar Iron, however, has taken a little turn for the better and is quoted \$1 advance on the ton. Our merchants are stocking up liberally for their Spring trade which usually sets in about the 10th of January.

Trade Topics.

In the existing conditions of business, and with the enterprise which is shown by merchants in different lines, there are indications that a larger variety of goods is being kept by many enterprising houses, and that some of these goods belong to lines other than those which have heretofore been regarded as regularly belonging to their business. It is not infrequently that we hear of furniture dealers handling Stoves, jewelers selling fine Cutlery and grocery houses dealing in Tacks and many kinds of household specialties. In a similar manner Hardware merchants, especially those who have suffered from this encroachment on what they regard as their proper territory, are disposed to enlarge their line of goods. The great Hardware jobbers of the West have thus been adding quite a number of lines which have not heretofore been regarded as belonging to Hardware. They are taking up Lamps, Jewelry and other goods which can be worked in connection with their other regular lines. It is obvious that this can be done with some advantage, giving them an increased variety of goods which they can offer through their travelers to the small trade. In working a town a Cutlery salesman often visits dry goods stores, drug stores, gentlemen's furnishing stores and fine jewelry stores, a fact which illustrates the point made above as to the extent which the lines of separation between the different branches of trade are being obliterated. In the case of the largest jobbing houses this tendency toward expansion of their line is most marked, and is to be accounted for in two ways: In the first place, it is the result of the energy and enterprise possessed by them, which, with their abundant capital, en-

ables them to adapt their business to the constantly changing conditions of trade, and to avail themselves of any opening that may present itself for the extension of their business. And often the fact that their regular Hardware business is being interfered with by the small jobbing houses, which have sprung up all through the Western country, has, doubtless, been influential in inducing this extension of their lines, inasmuch as without such additions to the variety of the goods offered by them it would not be feasible to prevent their business from diminishing in volume, while with these additions their business, notwithstanding new competitions, has probably for the past few years been slightly increasing.

A similar condition of things, though to a less marked degree, prevails in the retail Hardware trade. Instances will occur to our readers in which merchants are showing a disposition to go beyond the lines of demarcation by which Hardware is separated from other classes of trade. It will, however, be conceded that Hard-

The company refer to it as working very satisfactorily, alluding especially to the advantage possessed by it in the fact that there is an economy of time in connection with its use, inasmuch as several invoices can conveniently be paid with one blank.

Ironmongers and their Assistants.

Our English exchanges have recently been discussing the relations existing between merchants and their clerks, and complaints have been made on one side and the other of unreasonable requirements and inconsiderate treatment by the employer and of inattention to business, carelessness and general indifference to their principal's interests on the part of the clerks. The impression gained from reading the letters in this controversy is that there is a too general lack of that understanding which should exist between the merchant and those upon whose energy and fidelity he largely depends for the success of his business, and in this respect the conditions prevailing in England

Memorandum.

R. D. Cone Company,
WHOLESALE HARDWARE.

Winona, Minn. 1888.
To.....

Enclosed find Draft in payment of the following Invoice.

Date of invoice.	Gross amount.	Deductions.	Net amount.	Total net.

Please acknowledge receipt and oblige.

Yours truly,
R. D. Cone Company.

ware merchants have been more conservative in this matter than merchants in almost any other line of business, and have been reluctant to enter upon fields which do not properly belong to them. The extent, however, to which merchants in other lines have encroached upon the Hardware business often drives its merchants in self-protection to handle goods which more properly should be sold by some of their neighbors. This condition of things in the abstract is to be regretted. It would on many accounts be more desirable if merchants would keep closer to their own lines of trade, as this tendency is apt to result in diminished margins of profit, and in many ways to be ultimately disadvantageous to the trade.

Writing on the question as to whether or not it is advantageous for retailers to purchase direct from manufacturers, a Hardware merchant in Ohio says:

I have tried several times to buy from manufacturers, but have invariably found that prices, if not higher, were equal to those offered through jobbers, and had to buy more than I needed to obtain the discount. I now buy all I need of jobbers, except a few articles that they do not carry in stock.

Business Methods.

In view of the interest with which the form adopted by Elsworth & Dudley, Poughkeepsie, N. Y., for making their remittances has been regarded by the trade, we reproduce above in reduced size another form for the same purpose, which has been used for several years by the R. D. Cone Company, Winona, Minn. The entire width of this form is 8½ inches, and its depth about 5 inches. It is tastefully engraved and presents a neat appearance.

seem to contrast unfavorably with those which exist in this country. Referring to this matter, and, in a measure, summing up the controversy, the last issue of the *Ironmonger* remarks editorially as follows:

The correspondence which is currently appearing in our columns on the subject of ironmongers and their assistants serves to remind us anew that perfect harmony has not yet been secured between masters and men. Complaints are made by both sides that the other side is very far from being perfect, and it is obvious that there is a good deal of latent irritation in many quarters. It is a pity that this friction should exist, but it is there, and so long as human nature is what it is, there will often be a certain amount of jealousy and distrust between employers and employees. At the same time it is obviously quite within the bounds of possibility for this disturbing element to be reduced within very narrow bounds—indeed, it is not impossible for it to be wholly eliminated by judicious management. The employer who has a good assistant, and knows it, will generally trust that assistant more fully, and leave more to his discretion than he would were the assistant a mere machine at his work, or otherwise not up to the mark. In the same way an assistant who knows his work and takes an interest in it will have his employer's interests so much at heart that he can scarcely fail to earn and have the respect and consideration of his employer. Trust should, and generally will, beget trust, and mutual confidence should have the effect of furthering mutual interests. Where this amicable state of things does not exist, it is palpable that there is room for all sorts of ill feeling and mistrust. In such cases both masters and men cannot fail to suffer. If the employer cannot or does not trust his assistants, his business must involve him in a vast amount of personal worry, and probably actual losses, while if the assistant cannot trust his employer it is practically impossible for him to have his employer's affairs as much at heart as he ought to have. As our correspondence columns have shown, some of the employers complain that some of the as-

sistants are not sufficiently smart or pushing, and compare them disadvantageously with the dapper and alert young men of the drapery trade. It is possible that there may be a certain amount of truth in this allegation and comparison, but even admitting that that is the case, we are inclined to think that the difference is partly owing to the nature of the ironmongery trade and partly the fault of the employers who have trained the assistants. One employer thus may suffer from the faults of some other employer, but if he does so for any length of time it goes without saying that the fault becomes his own. No employer is compelled to keep an assistant who does not serve him well, and if he likes to put up with indifferent or slovenly service then he alone is to blame. If we assume, for the sake of argument, that all assistants are below par, and unequal to the work required at their hands, then it follows that while we deplore their want of capacity we must still attach a certain amount of blame to the employers as a body. The assistants complain that in many instances they are not allowed to see the *Ironmonger*, and thus are not fully posted up in what is going on in the trade by which they live. In the very nature of things this cannot be right or good policy—indeed, one would have supposed that every ironmonger would be only too pleased to let his assistants read and study the *Ironmonger* regularly and constantly. The more information an assistant possesses the better servant he should be; but if the representative paper of the trade is kept from him, it is perfectly clear that he lacks much that ought to be of direct benefit to himself as well as to his employer. We hope that there are very few instances indeed where this policy is pursued, and we are encouraged to express that hope by the knowledge that in many establishments the employer not only subscribes for himself, but also pays for copies for his assistants. In such establishments the whole of the staff are as well posted up as the travelers who call upon the master, and as well informed as the customer who has gained his information from some of the journals addressed to the general public. It is a sound maxim, indeed, which expresses the sentiment that no man can ever know too much, and it applies to the assistant as well as to the employer. With a little more liberality in this and other matters—especially in respect of cost prices—there ought to be a great improvement in the relations between the two grades of those who jointly constitute the retail branch of the trade. We are not without the hope that the improvement is gradually making itself felt. When it has become fully established we may expect to hear very little more of the complaints which have lately been addressed to us both by masters and assistants.

Arrangement of Stores Abroad.

The arrangement of retail stove and hardware stores is a subject which has received a great deal of attention in these columns for some time past, and from letters which have been received from those who have profited by the suggestions contained in the various articles presented, we feel that our efforts in this direction have not been in vain. The subject is of wide interest both in this country and abroad, and the trade papers on the other side are devoting more or less attention to it. A recent issue of *Ironmongery* contains a number of suggestions as to the proper arrangement of the stock of a hardware store, and we present it herewith as of possible interest to our American readers:

This is a subject which appears to us not to have received the attention it deserves—probably because of the obvious difficulties which its discussion involves. The numberless variations in the size and style which are presented by shop architecture make it a subject of the greatest difficulty. Still, it may be assumed that general principles may be laid down, which, while they must necessarily be varied to meet special circumstances, may be found of some practical value. For the purposes of this paper, we will then assume a shop of the usual type, with a frontage of two windows, and the entrance in the center, containing a counter down one side with drawers under it, and range of ordinary fixtures behind, and, if our readers like, a showroom or warehouse behind or above. It is probable, however, in the majority of

cases, that several smaller warehouses have from time to time been brought into requisition, as the expansion in the volume of stock has required it, and in this case the same principles will hold.

We begin, then, with the shop itself. It will be clear to the merest tyro that some system of arrangement is absolutely essential in order that the law of association may be exercised to enable the ironmonger to lay his hand at once upon any required article; hence every ironmonger will, as far as possible, group goods of a kindred character. He will, for instance, keep all his brass foundry together, and on no account allow it, as some slovens do, to be mixed up with a heterogeneous collection of black goods; and he will also extend the principle and arrange according to their classification the various sub-sections of each class of stock. Thus, assuming that he has a range of fixtures extending behind and running the entire length of his counter, he will find them the most convenient depository for his brass foundry and parcel goods generally, placing the first-mentioned nearest the door, because of their lighter and more attractive appearance, and the last-named at the further end, making a clear line of demarcation between the two. He will then arrange the brass foundry in sub-sections, not mixing up rack pulleys, and curtain rings, and fancy nails, and numerous other goods in inextricable confusion; but having a clearly defined space for everything, sash fasteners, for instance, occupying one division, rack pulleys another, and patent blind furniture another, and curtain rings and picture rings and all other articles being grouped in such a manner that to know where the leading article of a section is placed is to know where all the others are. Now, as to the method of keeping the stock, we are strongly in favor of the steel-bound cardboard boxes, which for convenience, attractiveness and cheapness are to be highly commended. Everybody has seen how untidy the best-kept shelves will in course of time become, as parcels have been frequently opened and their contents gradually abstracted, to say nothing of the considerable time involved in unwrapping and wrapping up, and the not inconsiderable expense of paper and twine. This is all obviated, once for all, if these boxes, which have a most neat and attractive appearance, are used, and they can be procured of any size required, so as to fill conveniently any sized division of the fixtures.

Thus, take, for instance, a dozen rack pulleys: let one be fastened on the outside with thin copper or brass wire, and put the remainder in their tissue paper inside, marking the number, cost and selling price inside the lid, and the article is permanently faced. The customer sees at once, while yet upon the shelves, the article he requires. It is taken from the box, the lid replaced, and the box is back upon the shelf in less time than a parcel can be opened. There is an enormous advantage in this, especially on busy days, or when a long "fiddling" carpenter's order is being filled, as every one who has seen the pile of open parcels littering the counter or floor will admit. Another great advantage offered by this system is that its very neatness inculcates a pride in having the remainder of the stock kept with such care and orderliness as not to destroy the *tout ensemble*. The expense need be no objection, as the entire cost of boxes, for fixtures of, say, 16 x 6 feet, would not exceed £3 or £4, and once provided they will last in good condition for many years. This, then, deals with that portion of the brass foundry and black ironmongery which is exposed for sale on shelves. The spare stock should be kept in their original parcels in the warehouse or other convenient place. The arrangement of tools is a most impor-

tant point. Where at all possible, a window should be specially reserved for these, or a portion of a window distinctly separated from the rest. The window should contain a sample of every tool contained in stock, for it is wonderful with what patience a workman will scan everything in the window until he sees the article he requires; and most ironmongers would find that a thoroughly well-dressed tool window would prove to be one of the most profitable investments. The spare tools may be kept in any convenient place, but, as far as possible, together, and always in paper, to protect them from the ravages of rust and dust. Such small tools as Lancashire tools, however, would, with advantage, be kept in drawers under the counter, while the remainder are stored in good deep shelves further away. And our advice to ironmongers and assistants is always to sell from the window where possible, notwithstanding the disarrangement and trouble this may cause, as by doing this the loss by depreciation of stock is reduced to a minimum.

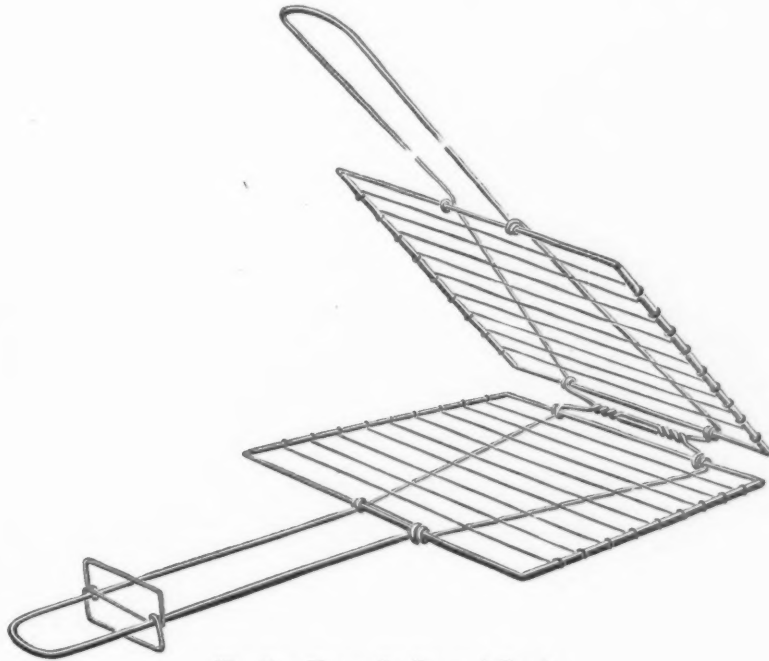
Cutlery and scissors, excepting where it is absolutely necessary to expose them, as in the window, should be kept under glass cases laid upon the counter or, where these are not available, in drawers. Electroplated goods should always be placed with due regard to light, and may often be made to give a light and cheerful appearance to an otherwise dark corner of the shop. They should always be kept in air-tight and dust-proof cases, as otherwise, unless the sale be very rapid, they will be the source of endless trouble, and considerably depreciate in value. Copper and planished tin goods should be allowed to remain in their original paper, except those examples required for exhibition, and these last should be always, where possible, sold first, and replaced with others fresh from the paper. Great care is required in the treatment of the finer qualities of japanned goods, as they are peculiarly susceptible to the action of air and gas. The display of these should be limited in point of quantity and duration of exposure, and the bulk of stock should always be kept most carefully in the softest tissue, and be contained in cupboard or drawers. Fenders are perhaps best shown in some of the numerous racks which have been introduced for that purpose, and fire-irons, always well and cleanly oiled, as far as possible should be exhibited in an upright position in a dust-proof case, or, where a case is not available, in properly made bags. For the purpose of effectively showing fenders it is desirable to have a fairly good register stove with a medium quality marble or slate mantelpiece, in some well-lighted position, with a fender and set of fire-irons in position. This renders it possible to exhibit any fender required in such a position that the customer sees at once its suitability in point of taste or style for the purpose required. The general position to be occupied by glass cases must be determined by considerations of shape and dimensions of shop, the question of light, &c. The great points to be attained are—to make an effective display of stock without incurring more depreciation from exposure than is absolutely necessary, and to have the bulk so placed that it is at any moment available. It is entirely useless to continue month after month the exhibition of samples which have been exposed until all their original freshness and gloss have been removed, and the only sensible and business-like plan is to make a point of selling from the exposed stock and of replacing it with new. This system will have the double effect of minimizing the depreciation of stock, and, what is hardly less important, insure a continual change in the character of the stock exposed, and so produce a more effective general result.

The New Haven Broiler and Toaster.

This article is shown in the illustration given below, and is manufactured by the New Haven Wire Goods Company, New Haven, Conn., who call attention to the new principle on which it is constructed. Instead of using a ring or link to connect the two parts they use their patent hinge, thus giving a special strength where other

the South or West will soon be built and will hold 1,500,000 feet of gas. The holder will be supported by columns 110 feet in height, and the receptacle itself will be 105 feet high and nearly 140 feet in diameter. The contract for this large vessel is not yet let, although the excavation is made and the foundation walls are nearly completed, requiring 1,700,000 brick to build it. The gas company, be-

in position securely locks and holds all parts together. The lid is dome-shaped, and readily admits of good sized cups or dishes to rest in the top section. The very best material, we are informed, is employed in the construction of this article, and the manufacturers offer it to the trade in the confident expectation that it will supply a requirement which has existed for a long time past.



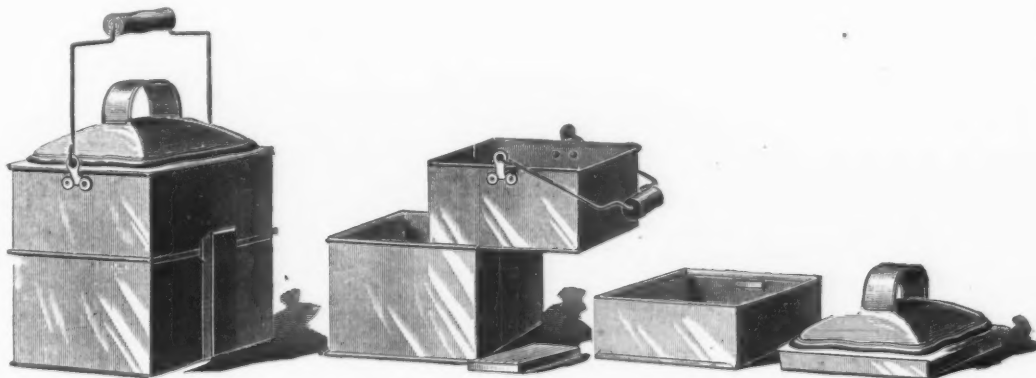
The New Haven Broiler and Toaster.

broilers are found to be weak. It will also be seen that the bars of these broilers, instead of running lengthwise, as in other broilers, extend crosswise, and being supported on the back by the heavy handle wires, which run the whole length, are kept from bending and remain in shape. To guard against the cross bars getting out of position or becoming loose a heavy tin ferrule is put between each and the next bar. The point is made that owing to the peculiar construction of the hinge joint these broilers when reversed can be shut perfectly close, or adapted to any thickness, thus making a perfect toaster.

sides providing amply for the city's wants in illuminating gas, propose to furnish water-gas for manufacturing and heating, at a cost of about 50 cents per 1000 feet. Geo. W. Morris, formerly of the firm of Geo. S. Moore & Co., pig iron, is president of the gas company and Mr. Hite Barrett is engineer.

The Picnic Dinner Pail.

The Ohio Tin and Copper Company, of Findlay, Ohio, are introducing to the trade a form of dinner pail or can as it is sometimes called, a general view of which



The Picnic Dinner Pail.

Their strength and durability, as well as the advantages alluded to above, are the points which are emphasized by the company. These broilers are made in six sizes, all of which are 9 inches in length and range in width from 6 to 13½ inches.

The Louisville Gas Company are spending several hundred thousands of dollars in increasing their facilities for making and storing gas. The improvements now going on are being built in the southern part of the city, where the largest gas receiver in

is afforded by the illustration presented herewith. By reference to the cut it will be seen that the pail is made of an upper and lower section and a tray. The top slides upon the bottom section in much the same manner as a drawer operates, the tray resting in the bottom section which forms the receptacle for tea, coffee or other liquids. The manufacturers direct particular attention to the fact that the slides are made of XXXX tin, and therefore is strong and durable. The knife and fork box is removable when desired, and when

which is said to be sufficient to boil a quart of water in much less than the time required by other spirit stoves. The cup as held in the frame is raised above the table on which it is placed, so that there is no danger of injury being done by the heat. The regulator, shown in Fig. 2, has a pivoted cover over the central opening, which can be closed or opened as desired.

Cormack & Co., importers of iron ore, formerly of 231 New street, New York, have transferred their business to Duluth,

Queen Spirit Stove.

This article is illustrated in the cuts herewith given, and is put on the market by Silver & Co., 56 Warren street, New



Fig. 1.—The Queen Spirit Stove.

York, Fig. 1 representing the stove proper, and Fig. 2 the regulator and extinguisher, by means of which the amount of heat given by the stove can be graduated according to circumstances and the stove

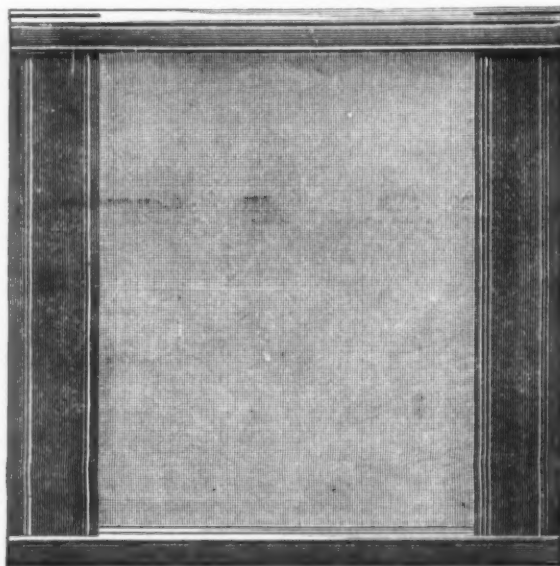


Fig. 2.—Regulator and Extinguisher.

Minn., having opened offices at 21 West Seventh avenue. They will give their attention to the domestic ore business.

The Bonanza Adjustable Window Screen.

* This screen, manufactured by A. J. Phillips & Sons, Fenton, Mich., is represented in the accompanying illustration.



The Bonanza Adjustable Window Screen.

As will be inferred from the cut, this frame has two movable wings $3\frac{1}{2}$ inches wide, one on each side of the frame, by which means it is adjusted to windows of different widths. The proper movement of these wings is controlled by slides top and bottom, which are covered by the caps the whole length of the frame, the slides being thus entirely concealed, making a plain and unbroken front and back. Both the wings and the frame are beaded on both sides. The screens are made of bass wood, well finished and dipped in oil, thus showing the grain of the wood. The Cortland wire cloth of standard mesh and quality is used. The manufacturers advise us that their object is to produce a well made article at a lower price than they can offer their hard wood line of screens. Three sizes of these screens are made: No. 10, 20 inches high, and No. 11, 24 inches high, both of which adjust from 24 to 30 inches in width, and No. 12, 24 inches high, which adjusts from 30 to 36 inches in width.

A pipe line connecting St. Louis with the Lima, Ohio, and Pennsylvania oil fields, via Chicago, is one of the probabilities of the ensuing 12 months. It is stated that the increasing consumption of fuel oils in St. Louis, through the introduction of improved oil burners for furnaces, had decided the Standard to continue its pipe line from Chicago to St. Louis, and that the pipe will be laid next spring. For an oil pipe line the best wrought-iron pipe is used. It must be capable of resisting a pressure of 3000 pounds, as the oil is forced up long and steep grades. The size used in other pipe lines is 8 inches in inside diameter. It costs about \$1 per linear foot, or over \$5000 per mile, and the cost of laying it is fully \$1000 per mile.

The work of dredging Gedney Channel, in New York Harbor, also Buttermilk Channel and Raritan Bay, has made good progress during the summer. The first mentioned is the most important, as the work includes dredging a channel 1000

feet wide and 30 feet deep at mean low water, extending from the deep water below the Narrows, through the main ship channel to deep water outside. The estimated cost of dredging the channel is \$1,490,000, but the total expense of the improvement, should the building of the contraction works be necessary, will be between \$5,000,000 and \$6,000,000. Up to the beginning of last month nearly 800,000 cubic yards had been removed.

water soaked, while the barrow is light to handle, strong, thoroughly braced and durable.

Coast Defenses and Cruisers.

The bill providing for coast fortifications introduced by Mr. Chipman, of Michigan, in the House, authorizes the Secretary of War to cause to be constructed two submerged turreted torpedo forts armed with two 16-inch rifled cannon, two pneumatic torpedo throwers, and six locomotive submerged torpedo guns, and, with two cable lines of torpediums for the protection of New York Harbor, to be placed, one on the shore side in 3 fathoms of water on Sandy Hook side, and one on the opposite side of the channel. Two similar forts are provided at each of the ports of Boston, Charleston and San Francisco. Of those at the latter point one fort shall be situated at Lime Point and one at Fort Point. The forts shall be built for the sum not exceeding \$2,000,000 each, exclusive of armaments. This shall include a sum of \$50,000 as a royalty for the exclusive use of the inventions of William M. McCarty. An appropriation of \$4,000,000 is made.

Mr. Chipman also introduced a bill authorizing the Secretary of the Navy to cause to be constructed one steel armored submerging cruiser of about 8000 tons displacement, provided with three-bladed screws, and of a speed not less than 22 knots per hour. The cruiser shall be armed with two 12-inch high powered rifled guns, four 10-inch rifled guns and a suitable secondary battery, and shall be provided with four torpedo tubes. The cruiser shall cost, exclusive of armament, a sum not to exceed \$4,000,000, the whole sum being appropriated by the bill.

In reply to the statement of the Interstate Commission's report that the operation of the law was generally beneficial to railroads, the *Railroad Gazette* shows the decline in the price of shares since the law went into effect. In New York 46 stocks have declined in value \$221,000,000 and five have risen in value \$4,750,000. The total par value of the stocks mentioned is \$1,500,000,000. The shares showing the

Solid Steel Tray Wheelbarrow.

This wheelbarrow is made by the American Steel Scraper Co., Sidney, Ohio. It is represented in the accompanying illustration.



Solid Steel Tray Wheelbarrow.

tration. It has, as will be seen, a metal frame and the tray is made from one plate of steel. The wheel has a wrought iron rim $1\frac{1}{2}$ inches wide, with heavy steel spokes headed and shouldered at each end, which adds greatly to the strength of the wheel, without materially increasing its weight. It is referred to as especially adapted to mining and for use about furnaces and foundries, for mortar, or for handling dirt. The point is made that there is no wood to warp, split or get

greatest loss are: The Atchison, \$39,000,000; Chicago, Burlington and Quincy, \$26,750,000; St. Paul, \$16,750,000; Missouri Pacific, \$17,250,000; Rock Island, \$12,000,000; Denver, \$5,750,000; Chicago and Northwestern, \$7,750,000; Missouri, Kansas and Texas, \$9,500,000, and Richmond Terminal, \$7,500,000. That these losses have been due entirely to the Interstate bill would be hard to prove, but the *Gazette* argues that this is the case.

Wrought (Steel)	
Fast Joint, Narrow	dis 70x10
Fast Joint, Lt. Narrow	dis 70x10
Fast Joint, Broad	dis 70x10
Loose Joint, Broad	dis 70x10
Table Butts, Back Flaps, &c.	dis 70x10
Inside Blind, Regular	dis 70x10
Inside Blind, Light	dis 70x10
Loose Pin	dis 70x10
Bronzed Wrought Butts	dis 40x10 & 40x10

Calipers.—See Compasses.

Calipers, Toe	
Gautier	dis 5x10
Dewicks	dis 5x10

Can Openers.

Messenger's Comet	dis 35.00, dis 25
American	dis 35.00, dis 25
Duplex	dis 25, dis 15
Lyman's	dis 35.75, dis 20
No. 4, French	dis 22.25, dis 55
No. 5, Iron handle	dis 22.50, dis 10
Eureka	dis 22.50, dis 10
Sardine Cutters	dis 22.75, dis 10
Star	dis 22.75, dis 10
Springue, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	dis 22.50, dis 10
World's Best	dis 22.50, dis 10
No. 3, 36.00	dis 22.50, dis 10
Universal	dis 22.50, dis 10
Domestic	dis 22.50, dis 10
Champion	dis 22.50, dis 10

Cards.

Horse and Curry	dis 10x10 & 10x10
Cotton	dis 10x10 & 10x10
Wool	dis 10x10 & 10x10

Carpet Stretchers.

Cast Steel, Polished	dis 22.25
Cast Iron, Steel Points	dis 22.25
Socket	dis 22.25
Bullard's	dis 22.25 & 25x10

Carpet Sweepers.

Bissell No. 5	dis 17.00
Bissell No. 7, New Drop Pan	dis 17.00
Bissell Grand	dis 17.00
Grand Rapids	dis 17.00
Crown Jewel	dis 17.00
Magic	dis 17.00
Jewel	dis 17.00
Improved Parlor Queen, Nickeled	dis 17.00
Improved Parlor Queen, Japanned	dis 17.00
Exc. Isl. r.	dis 17.00
Garland	dis 17.00
Parlor Queen	dis 17.00
Housewife's Delight	dis 17.00
Queen	dis 17.00
Queen, with band	dis 17.00
King	dis 17.00
Weed Improved	dis 17.00
Hub	dis 17.00
Cor Wheel	dis 17.00
Conqueror	dis 17.00
Easy	dis 17.00
Monarch	dis 17.00
Gosher	dis 17.00
Advance	dis 17.00
Ladies' Friend, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	dis 17.00
Grand Republic	dis 17.00

Cartridges.—See Ammunition.

Casters.

Bed	New list
Plate	dis 55 & 55x5
Shadow Socket	dis 60 & 60x5
Deep Socket	dis 40x10
Yale Casters, list May, 1888	dis 80x10 & 40
Yale, Gem	dis 60x10 & 50
Martin's Patent (Phoenix)	dis 60 & 60x10
Payson's Anti-friction	dis 60 & 60x10
"Giant" Truck Casters	dis 10 & 10x5
Stationary Truck Casters	dis 45x10

Cattle Leaders.

Humason, Beckley & Co.'s	dis 70
Sargent's	dis 60x10
Hotchkiss	dis 30
Peck Stow & W. Co.	dis 50x10

Chain.

Trace, 6-10-2, exact sizes, pair, 1.11	dis 50x10
Trace, 6-10-3, exact sizes, pair, 1.11	dis 50x10
Trace 7-10-2, exact sizes, pair, 1.11	dis 50x10
NOTE.—Traces, "Regular" sizes 3c net per pair less than exact.	
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....	dis 50x10 & 50x10x5
American Coil 3-16 5-16 7-16 9-16 11-16 13-16 15-16 17-16 19-16 21-16 23-16 25-16 27-16 29-16 31-16 33-16 35-16 37-16 39-16 41-16 43-16 45-16 47-16 49-16 51-16 53-16 55-16 57-16 59-16 61-16 63-16 65-16 67-16 69-16 71-16 73-16 75-16 77-16 79-16 81-16 83-16 85-16 87-16 89-16 91-16 93-16 95-16 97-16 99-16 101-16 103-16 105-16 107-16 109-16 111-16 113-16 115-16 117-16 119-16 121-16 123-16 125-16 127-16 129-16 131-16 133-16 135-16 137-16 139-16 141-16 143-16 145-16 147-16 149-16 151-16 153-16 155-16 157-16 159-16 161-16 163-16 165-16 167-16 169-16 171-16 173-16 175-16 177-16 179-16 181-16 183-16 185-16 187-16 189-16 191-16 193-16 195-16 197-16 199-16 201-16 203-16 205-16 207-16 209-16 211-16 213-16 215-16 217-16 219-16 221-16 223-16 225-16 227-16 229-16 231-16 233-16 235-16 237-16 239-16 241-16 243-16 245-16 247-16 249-16 251-16 253-16 255-16 257-16 259-16 261-16 263-16 265-16 267-16 269-16 271-16 273-16 275-16 277-16 279-16 281-16 283-16 285-16 287-16 289-16 291-16 293-16 295-16 297-16 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585-16 587-16 589-16 591-16 593-16 595-16 597-16 599-16 601-16 603-16 605-16 607-16 609-16 611-16 613-16 615-16 617-16 619-16 621-16 623-16 625-16 627-16 629-16 631-16 633-16 635-16 637-16 639-16 641-16 643-16 645-16 647-16 649-16 651-16 653-16 655-16 657-16 659-16 661-16 663-16 665-16 667-16 669-16 671-16 673-16 675-16 677-16 679-16 681-16 683-16 685-16 687-16 689-16 691-16 693-16 695-16 697-16 699-16 701-16 703-16 705-16 707-16 709-16 711-16 713-16 715-16 717-16 719-16 721-16 723-16 725-16 727-16 729-16 731-16 733-16 735-16 737-16 739-16 741-16 743-16 745-16 747-16 749-16 751-16 753-16 755-16 757-16 759-16 761-16 763-16 765-16 767-16 769-16 771-16 773-16 775-16 777-16 779-16 781-16 783-16 785-16 787-16 789-16 791-16 793-16 795-16 797-16 799-16 801-16 803-16 805-16 807-16 809-16 811-16 813-16 815-16 817-16 819-16 821-16 823-16 825-16 827-16 829-16 831-16 833-16 835-16 837-16 839-16 841-16 843-16 845-16 847-16 849-16 851-16 853-16 855-16 857-16 859-16 861-16 863-16 865-16 867-16 869-16 871-16 873-16 875-16 877-16 879-16 881-16 883-16 885-16 887-16 889-16 891-16 893-16 895-16 897-16 899-16 901-16 903-16 905-16 907-16 909-16 911-16 913-16 915-16 917-16 919-16 921-16 923-16 925-16 927-16 929-16 931-16 933-16 935-16 937-16 939-16 941-16 943-16 945-16 947-16 949-16 951-16 953-16 955-16 957-16 959-16 961-16 963-16 965-16 967-16 969-16 971-16 973-16 975-16 977-16 979-16 981-16 983-16 985-16 987-16 989-16 991-16 993-16 995-16 997-16 999-16 1001-16 1003-16 1005-16 1007-16 1009-16 1011-16 1013-16 1015-16 1017-16 1019-16 1021-16 1023-16 1025-16 1027-16 1029-16 1031-16 1033-16 1035-16 1037-16 1039-16 1041-16 1043-16 1045-16 1047-16 1049-16 1051-16 1053-16 1055-16 1057-16 1059-16 1061-16 1063-16 1065-16 1067-16 1069-16 1071-16 1073-16 1075-16 1077-16 1079-16 1081-16 1083-16 1085-16 1087-16 1089-16 1091-16 1093-16 1095-16 1097-16 1099-16 1101-16 1103-16 1105-16 1107-16 1109-16 1111-16 1113-16 1115-16 1117-16 1119-16 1121-16 1123-16 1125-16 1127-16 1129-16 1131-16 1133-16 1135-16 1137-16 1139-16 1141-16 1143-16 1145-16 1147-16 1149-16 1151-16 1153-16 1155-16 1157-16 1159-16 1161-16 1163-16 1165-16 1167-16 1169-16 1171-16 1173-16 1175-16 1177-16 1179-16 1181-16 1183-16 1185-16 1187-16 1189-16 1191-16 1193-16 1195-16 1197-16 1199-16 1201-16 1203-16 1205-16 1207-16 1209-16 1211-16 1213-16 1215-16 1217-16 1219-16 1221-16 1223-16 1225-16 1227-16 1229-16 1231-16 1233-16 1235-16 1237-16 1239-16 1241-16 1243-16 1245-16 1247-16 1249-16 1251-16 1253-16 1255-16 1257-16 1259-16 1261-16 1263-16 1265-16 1267-16 1269-16 1271-16 1273-16 1275-16 1277-16 1279-16 1281-16 1283-16 1285-16 1287-16 1289-16 1291-16 1293-16 1295-16 1297-16 1299-16 1301-16 1303-16 1305-16 1307-16 1309-16 1311-16 1313-16 1315-16 1317-16 1319-16 1321-16 1323-16 1325-16 1327-16 1329-16 1331-16 1333-16 1335-16 1337-16 1339-16 1341-16 1343-16 1345-16 1347-16 1349-16 1351-16 1353-16 1355-16 1357-16 1359-16 1361-16 1363-16 1365-16 1367-16 1369-16 1371-16 1373-16 1375-16 1377-16 1379-16 1381-16 1383-16 1385-16 1387-16 1389-16 1391-16 1393-16 1395-16 1397-16 1399-16 1401-16 1403-16 1405-16 1407-16 1409-16 1411-16 1413-16 1415-16 1417-16 1419-16 1421-16 1423-16 1425-16 1427-16 1429-16 1431-16 1433-16 1435-16 1437-16 1439-16 1441-16 1443-16 1445-16 1447-16 1449-16 1451-16 1453-16 1455-16 1457-16 1459-16 1461-16 1463-16 1465-16 1467-16 1469-16 1471-16 1473-16 1475-16 1477-16 1479-16 1481-16 1483-16 1485-16 1487-16 1489-16 1491-16 1493-16 1495-16 1497-16 1499-16 1501-16 1503-16 1505-16 1507-16 1509-16 1511-16 1513-16 1515-16 1517-16 1519-16 1521-16 1523-16 1525-16 1527-16 1529-16 1531-16 1533-16 1535-16 1537-16 1539-16 1541-16 1543-16 1545-16 1547-16 1549-16 1551-16 1553-16 1555-16 1557-16 1559-16 1561-16 1563-16 1565-16 1567-16 1569-16 1571-16 1573-16 1575-16 1577-16 1579-16 1581-16 1583-16 1585-16 1587-16 1589-16 1591-16 1593-16 1595-16 1597-16 1599-16 1601-16 1603-16 1605-16 1607-16 1609-16 1611-16 1613-16 1615-16 1617-16 1619-16 1621-16 1623-16 1625-16 1627-16 1629-16 1631-16 1633-16 1635-16 1637-16 1639-16 1641-16 1643-16 1645-16 1647-16 1649-16 1651-16 1653-16 1655-16 1657-16 1659-16 1661-16 1663-16 1665-16 1667-16 1669-16 1671-16 1673-16 1675-16 1677-16 1679-16 1681-16 1683-16 1685-16 1687-16 1689-16 1691-16 1693-16 1695-16 1697-16 1699-16 1701-16 1703-16 1705-16 1707-16 1709-16 1711-16 1713-16 1715-16 1717-16 1719-16 1721-16 1723-16 1725-16 1727-16 1729-16 1731-16 1733-16 1735-16 1737-16 1739-16 1741-16 1743-16 1745-16 1747-16 1749-16 1751-16 1753-16 1755-16 1757-16 1759-16 1761-16 1763-16 1765-16 1767-16 1769-16 1771-16 1773-16 1775-16 1777-16 1779-16 1781-16 1783-16 1785-16 1787-16 1789-16 1791-16 1793-16 1795-16 1797-16 1799-16 1801-16 1803-16 1805-16 1807-16 1809-16 1811-16 1813-16 1815-16 1817-16 1819-16 1821-16 1823-16 1825-16 1827-16 1829-16 1831-16 1833-16 1835-16 1837-16 1839-16 1841-16 1843-16 1845-16 1847-16 1849-16 1851-16 1853-16 1855-16 1857-16 1859-16 1861-16 1863-16 1865-16 1867-16 1869-16 1871-16 1873-16 1875-16 1877-16 1879-16 1881-16 1883-16 1885-16 1887-16 1889-16 1891-16 1893-16 1895-16 1897-16 1899-16 1901-16 1903-16 1905-16 1907-16 1909-16 1911-16 1913-16 1915-16 1917-16 1919-16 1921-16 1923-16 1925-16 1927-16 1929-16 1931-16 1933-16 1935-16 1937-16 1939-16 1941-16 1943-16 1945-16 1947-16 1949-16 1951-16 1953-16 1955-16 1957-16 1959-16 1961-16 1963-16 1965-16 1967-16 1969-16 1971-16 1973-16 1975-16 1977-16 1979-16 1981-16 1983-16 1985-16 1987-16 1989-16 1991-16 1993-16 1995-16 1997-16 1999-16 2001-16 2003-16 2005-16 2007-16 2009-16 2011-16 2013-16 2015-16 2017-16 2019-16 2021-16 2023-16 2025-16 2027-16 2029-16 2031-16 2033-16 2035-16 2037-16 2039-16 2041-16 2043-16 2045-16 2047-16 2049-16 2051-16 2053-16 2055-16 2057-16 2059-16 2061-16 2063-16 2065-16 2067-16 2069-16 2071-16 2073-16 2075-16 2077-16 2079-16 2081-16 2083-16 2085-16 2087-16 2089-16 2091-16 2093-16 2095-16 2097-16 2099-16 2101-16 2103-16 2105-16 2107-16 2109-16 2111-16 2113-16 2115-16 2117-16 2119-16 2121-16 2123-16 2125-16 2127-16 2129-16 2131-16 2133-16 2135-16 2137-16 2139-16 2141-16 2143-16 2145-16 2147-16 2149-16 2151-16 2153-16 2155-16 2157-16 2159-16 2161-16 2163-16 2165-16 2167-16 2169-16 2171-16 2173-16 2175-16 2177-16 2179-16 2181-16 2183-16 2185-16 2187-16 2189-16 2191-16 2193-16 2195-16 2197-16 2199-16 2201-16 2203-16 2205-16 2207-16 2209-16 2211-16 2213-16 2215-16 2217-16 2219-16 2221-16 2223-16 2225-16 2227-16 2229-16 2231-16 2233-16 2235-16 2237-16 2239-16 2241-16	

Hickory Firmer Chisel, assorted. \$ gross 4.00
 Hickory Firmer Chisel, large. \$ gross 5.00
 Apple Firmer Chisel, assorted. \$ gross 5.00
 Apple Firmer Chisel, large. \$ gross 6.00
 Socket Firmer Chisel, assorted. \$ gross 3.00
 Socket Framing Chisel, assorted. \$ gross 5.00
 J. B. Smith Co.'s Pat. File. \$ dis 50
 File, assorted. \$ gross 2.75 \$ dis 40
 Auger, assorted. \$ gross 7.00 \$ dis 40
 Auger, large. \$ gross 7.00 \$ dis 40
 Patent Auger, Ives'. \$ dis 30
 Patent Auger, Douglas'. \$ set \$1.25 net
 Patent Auger, Swan's. \$ set \$1.00 net
 Hoe, Rake, Shovel, &c. \$ dis 50
 Cross Cut Hand Saws—
 Atkins' No. 1, 2, pair, 30" No. 3, 22" No. 2,
 and No. 4 Reversible, 22". \$ 50, dis 60
 Boynton's Loop Saw Handles. \$ 50, dis 60
 Champion \$ 150
Hangers.
 Barn Door, old pattern. \$ dis 60 \$ 10 \$ 70
 Barn Door, new England. \$ dis 60 \$ 10 \$ 70
 Barn Door, el. Anti-Friction. \$ dis 50
 Orleans Steel. \$ dis 50
 Hamilton Wrought Wood Track. \$ dis 50
 U. S. Wood Track. \$ dis 50
 Champion. \$ dis 60
 Rider and Wooster, Medina Mfg. Co.'s list. \$ dis 7
 Climax Steel Anti-Friction. \$ dis 50
 Zenith for Wood Track. \$ dis 50
 Reed's Steel Arm. \$ dis 50
 Challenge, Barn Door. \$ dis 50
 Sterilizing Improved (Anti-Friction). \$ dis 50
 Victor, No. 1, 15; No. 2, \$10.50; No. 3, \$15. \$ dis 50
 Kidder's. \$ dis 60
 The "Boss". \$ dis 50
 Best Anti-Friction. \$ dis 50
 Duplex (Wood Track). \$ dis 50
 Terry's Patent. \$ dis 50
 Cronk's Patent. \$ dis 50
 Wood Track Iron Clad. \$ dis 50
 Carrier Steel Anti-Friction. \$ dis 50
 Architect. \$ dis 50
 Eclipse. \$ dis 50
 Richmond. \$ dis 50
 Lane's Steel Anti-Friction. \$ dis 50
 The Ball Bearing Door Hanger. \$ dis 50
 Warner's Patent. \$ dis 50
 Stearns' Anti-Friction. \$ dis 50
 Stearns' Challenge. \$ dis 50
 Faultless. \$ dis 50
 Rider & Wooster, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662,

Flat Head, Iron.....	dls 65 ¢
Round Head, Iron.....	dls 50 ¢
Bench and Hand—	
Bench, Iron.....	dls 55&10 ¢ 55&10&10 ¢
Bench, Wood, Bench.....	¢ dos 22 25
Hand, Wood, Hickory.....	dls 20&10 ¢
Hand, Wood.....	dls 25&10 ¢ 25&10&8 ¢
Lag, Blunt Point.....	dls 75 ¢ 75&10 ¢
Couch and Lag, Glimet Point.....	dls 75 ¢
Bed.....	dls 25&8 ¢
Hand Rail, Sargent's.....	dls 90&10 ¢
Hand Rail, Hummer, Hockley & Co.'s.....	dls 70&10 ¢ 75 ¢
Hand Rail, Sargent's.....	dls 75 ¢
Jack Screws, Millers Falls List.....	dls 50 ¢ 50&8 ¢
Jack Screws, P. S. & W.....	dls 35 ¢
Jack Screws, Sargent.....	dls 60&10 ¢ 60&10&8 ¢
Jack Screws, Stearns.....	dls 40 ¢ 40&10 ¢
Scroll Saws.....	
Lester, complete, \$10.00.....	dls 25 ¢
Rozers complete, \$4.00.....	¢ dos 25 ¢
Barnes' Builders' and Cabinet Makers', \$15.....	dls 25 ¢
Barnes' Scroll Saw Blades.....	dls 35 ¢
Scythe Snaths.....	dls 50&2 ¢
Shears.....	
American (Cast) Iron.....	dls 75&10 ¢ 75&10&8 ¢
Pruning.....	. See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....	¢ dos 32 ¢
Tinners'.....	dls 20&2 ¢
Seymour's, List Dec. 1881 dls 60&10&10 ¢ 60&10&10&8 ¢	
Helmach's, List Dec. 1881, dls 60&10&10 ¢ 60&10&10&8 ¢	
Helmach's Tailor's Shears.....	dls 30&8 ¢
Trimmer's.....	dls 30&8&10 ¢
Second quality C. S. Trimmers, dls 80&10 ¢ 80&10&10 ¢	
Acme Cast Shears.....	dls 10&10 ¢
Diamond Cast Shears.....	dls 10 ¢
Clippers.....	dls 10&10 ¢
Victor Cast Shears.....	dls 75&10 ¢ 75&10&8 ¢
Fryer's, Hulbert, Solid Forged Steel.....	dls 40 ¢
Cleveland Machine Co., Solid Steel Forged.....	dls 70 ¢
Clausen Shear Co., Japanese.....	dls 70 ¢
Clausen Shear Co., Nickeled, same list.....	dls 60 ¢
Shavers.....	
Sliding Door—	
M. W. & Co., list July, 1888.....	dls 50&10 ¢ 50&8 ¢
R. & E., list Dec. 18, 1885.....	dls 55&2 ¢
Corbin's list.....	dls 60&10&2 ¢
Patent Roller.....	dls 60&10&2 ¢
Frye Roller, Heifers'.....	dls 75 ¢
Shaver's Anti-Friction, list Dec. 18, 1885.....	dls 60&2 ¢
Moore's Anti-Friction.....	dls 60 ¢
Sliding Saw—	
R. & E. list Dec. 18, 1885.....	dls 60&10&2 ¢
Sargent's list.....	dls 60&10 ¢
Reading list.....	dls 60&10&10 ¢
Shoe Tools.....	
L. J. White.....	dls 30&8 ¢
Albertson Mfg. Co.....	dls 30 ¢
Shoes, Horse, Mule, &c.	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—Add \$1 ¢ keg to above prices.	
Ox, Wrought—	
Ton lots.....	¢ dos 96 ¢
100 lbs.....	¢ dos 96 ¢
500 lbs.....	¢ dos 96 ¢
Shot.—(Eastern prices, 2¢ off each, 5 days.)	
Drop, ¢ bag, 25 lb.....	\$1.10
Drop, ¢ bag, 5 lb.....	.20
Buck and Chilled, ¢ 25-lb bag.....	1.41
Buck and Chilled, ¢ 5-lb bag.....	.34
Shovels and Spades.....	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	dls 90 ¢
Nortz.—Jobbers frequently give 5 ¢ or 7½ ¢ extra on	
Grinth's Black Iron.....	dls 50&10 ¢
Grinth's C. S.....	dls 60 ¢ 60&10 ¢
Grinth's Solid Cast Steel R. R. Goods.....	dls 20 ¢
Old Colony (Sanford Fork & Tool Co.).....	dls 20 ¢
St. Louis Street Car Co.....	dls 20 ¢ 20&7¼ ¢
Hubbard & Co.....	dls 15 ¢ 15 ¢
Hubbard & Co.....	dls 20&20&7¼ ¢
Lehigh Mfg. Co.....	dls 50&10 ¢
Payne Pettibone & Son, list January, 1885.....	dls 30 ¢
Remington's (Lowman's Patent),.....	dls 30&10 ¢ 40 ¢
Rowland's, Black Iron.....	dls 50&10 ¢
Rowland's Steel.....	dls 60&8 ¢ 60&10 ¢
Shovels and Tongs.....	dls 60&10 ¢ 60&10&8 ¢
Iron Head.....	dls 60&10&10 ¢
Skins, Thimble.....	
Western list.....	dls 75&5 ¢ 75&10 ¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	dls 20 ¢
Coldbrookdale Iron Co.....	dls 50&10 ¢
Utica F. I. Patina.....	dls 35 ¢
Turned and Fitted.....	dls 35 ¢
Sieves.....	
Buffalo Metallic, S. S. & Co., new list.....	dls 50&25&10 ¢
Barier Flour Sifters.....	¢ dos 22.00 ¢
Smith's Adjustable Sifters.....	¢ dos 22.25 ¢
Smith's Adjustable Milk Strainer.....	¢ dos 22.00 ¢
Smith's Adjustable F. & C. Strainer.....	¢ dos 22.75 ¢
Wooden Strainer.....	Plated.
Mesh 18, Nested, ¢ dos.....	70¢ 90¢
Mesh 20, Nested, ¢ dos.....	85¢ 11.00 ¢
Mesh 24, Nested, ¢ dos.....	\$1.00 1.10 ¢
Snaps.—School, by case.....	dls 50&10 ¢
Snaps, Hard, &c.....	
Armstrong Mfg Co.....	dls 65 ¢
Pitch's Bristol.....	dls 60&10 ¢
Hotchkiss.....	dls 50 ¢
Andrews.....	dls 50 ¢
Sargent's Patent Guarded.....	dls 70&10&10 ¢
German, new list.....	dls 40&10 ¢
Covert.....	dls 50&10 ¢
Covert New B. E.....	dls 60&2 ¢
Covered Springs.....	dls 60&10&10 ¢
Soldering Irons.....	
Covert's Adjustable, list Jan. 1, 1885.....	dls 35&2 ¢
Spoke Shaves—Iron.....	dls 45 ¢
World.....	dls 50&10 ¢
Baldwin, Stianie R. & L. Co., list.....	dls 40&10 ¢
Stearns'.....	dls 30&10 ¢ 30 ¢
Spoke Trimmers.....	
Bonney's.....	¢ dos 10.00 ¢ 10 ¢
Stearns'..... No. 1, \$15.00; No. 2, \$12.00 ¢	dls 20&10 ¢ 55&10 ¢
Doane.....	¢ dos \$9.00 ¢ 10 ¢
Spoons and Forks.....	
Tinned Iron—	
Basting, Central Stamping Co.'s list.....	dls 70&10 ¢
Table and Tea, Central Stamping Company's	
list.....	dls 70&10 ¢

Springs.
All ptle. Concord, Platform and Half Scroll.....dis 60 @ 60x8 ½
Cliff s Bolster Springsdis 2b ½

Squares.
Steel and Iron..... } dis 75-10 @ 80 ½
Nickel-Plated..... }

Ty Square and T Bevels..... dis 60x10-10 @ 70 ½
Diamond Square and T Bevels..... dis 45x10 ½
Winterbottom's Try and Miter..... dis 30x10 ½
Starrett's Micrometer Calliper Squares.....dis 25 ½

Staples.
Fence Staples, Galvanized } Same price as Barb Wire.
Fence Staples, Plain.....} See Trade Report.

Steelyards..... dis 40x10@50 ½

Stocks and Dies.
Blacksmith's Waterford Goods dis 30x5 @ 30x10 ½
Blacksmith's, Futterfield's goods dis 30x5 @ 20x10 ½
Lumining screw Plate.....dis 25 @ 30 ½
Reece's New Screw Plates.....dis 33x25 @ 40 ½

Stone.
Hindustan No. 1, 3g; Axe, 5g; Slips No. 1, 6e..
Washta Stone, No. 1.....\$ 15 @ 22 ½
Washta Stone, No. 2.....\$ 15 @ 16 ½
Washta Stone, No. 1.....\$ 11 @ 12 ½
Washta Slips, No. 1, Extra.....40 @ 42 ½
Washta Slips, No. 1.....\$ 30 @ 32 ½
Arkansas Stone, No. 1, 4 to 6 in.....\$ 1, 35
Turkey Oil Stone.....\$ 1, 75
Turkey Slips.....\$ 1, \$1.00 @ \$1.50
Lake Superior, Chase.....\$ 1, 16 ½
Lake Superior Slips, Chase.....\$ 1, 31c32c
Seneca Stone, Red Paper Brand, \$ 1.....18 @ 20 ½
Seneca Stone, Small White gro.....20 @ 25c
Seneca Stone, Small White gro.....\$ 24.00

Stone Polish.—Joseph Dixon's. \$ gro 10, dis 10 ½
Gem.....\$ gro 14.50, dis 10 ½
Gold Medal.....\$ gro 16.00, dis 25 ½
"Mirror".....\$ gro 16.00, dis —
Lustro.....\$ gro 14.75 net
Lustro.....\$ gro 13.75 net
Rialto \$ gro, 10lb.....\$ gro 15.50
Dixon's Plumbago.....\$ 10 @ 12 ½
Boynton's Noon Day.....\$ 5.00
Parlor Pride Stone Emamel.....\$ gross, \$13
Yates' Liquid.....2 3 5 10 gal cans
Yates' gal., \$0.50 .80 .70 .60
Swedes Standard Paste Polish 10-lb cans, per lb, 15 c
Jet Black.....\$ gro 15.50
Japanese.....\$ gro 13.50
Firesteel.....\$ gro 12.50
Diamond O. K Enamel.....\$ gro 19.00
Bonnell's Liquid Stone Polish.....\$ gro 14.00
Bonnell's Fast Rubbing Stone.....\$ gro 14.00
Black Cat Benzine Frater and 10 lb. cans.....12 ½
Black Jack Water Paste, 5 and 10 lb. cans.....\$ 10
Nickel Plate Paste, per gross.....\$ 30.00

Tacks, Brads, &c.
List Jan. 2, 1888.
American Iron Carpe' Tacks.....dis 80 @ 80x5 ½
Steel Carpet Tacks.....dis 80 @ 80x5 ½
Steel Carpet Tacks.....dis 80 @ 80x5 ½
American Iron Cut Tacks.....dis 75 @ 75x10 ½
Swedes Iron Tacks.....dis 75 @ 75x10 ½
Swedes Iron Upholsterers' Tacks.....dis 75x10 @ 75x10x5 ½
Tinned Swedes Iron Tacks.....dis 75x10 @ 75x10x5 ½
Tinned Swedes Iron Upholsterers' Tacks.....dis 75x10 @ 75x10x5 ½
Gimp and Lace Tacks.....dis 75x10 @ 75x10x5 ½
Tinned Gimp and Lace Tacks.....dis 75x10 @ 75x10x5 ½
Swedes Iron Trimmers' Tacks.....dis 75x10 @ 75x10x5 ½
Swedes Iron Miners' Tacks.....dis 75x10 @ 75x10x5 ½
Swedes Iron Bill Posters' or Railroad Tacks.....dis 75x10 @ 75x10x5 ½
Swedes Steel Tacks, all kinds (Swedes Iron price fat).....dis 75x10x5 ½

Copper Tacks.....dis 75x10x5 ½
Copper Finishing Trunk and Clout Nails.....dis 70x10 @ 70x10x10 ½
Finishing Nails.....dis 70x10 @ 70x10x10 ½
Trunk and Clout Nails.....dis 70x10 @ 70x10x10 ½
Tin'd Trunk and Clout Nails.....dis 70x10 @ 70x10x10 ½
Bed Nails.....dis 70x10 @ 70x10x10 ½
Common and "Pied" Brads.....dis 70x10 @ 70x10x10 ½
Hungarian Nails.....dis 70x10 @ 70x10x10 ½
Chair Nails.....dis 70x10 @ 70x10x10 ½
Zinc Glaziers' Points.....1st 0 @ 60c ½
Picture Box Nails.....dis 50x10 @ 50x10x5 ½
Figure-Frame Points.....dis 50x10 @ 50x10x5 ½
Nashua Nail Co.'s.....dis 50x10 @ 50x10x5 ½
Leathered Carpet Tacks.....dis 50x10 @ 50x10x5 ½
Brush Tacks.....dis 50x10 @ 50x10x5 ½
Shoe Finders'. List Jan. 2, 1888, dis 10x10 @ 11 @ 10x25 ½
Lining and Saddle Nails, List Jan. 1, 1888:
Silvered.....dis 30x10x10 ½
Japanned.....dis 20x10x10 ½
Decks.....dis 20x10x10 ½
Wire Carpet Nails.....dis 85 ½
Wire Brads and Nails.....See Nails, Wire
Steel Wire Brads, R. & E. Mfg. Co.'s list.....dis 50x10 ½
Tap Borers.—Common and Rio.....dis 20x10 ½
ives' Tap Borers.....dis 33x45 ½
Enterprise Mfg. Co.....dis 20x10 @ 30 ½
Chisels.....dis 33x45 ½

Tape, Measuring.—American.....dis 25x10 ½
Spring.....dis 20x10 ½
Chesterman's.....Regular list dis 25 @ 30 ½
Thermometers.—Tin Case.....dis 80 @ 80x10 ½
Thimble Skins.—See Skins.
Ties, Bale.—Steel Wire, Stan'd list, dis 50x10x25 ½
Unners' Shoes, &c.
Shear and Light B. S. & W.....dis 20 @ 25 ½
Punches—See Punches.
Snips, J. Mallinson & Co.....dis 33x45 ½

Tinware.
Stamped, Japanned & Pieced, list Jan. 20, 18.....dis 70x10 @ 70x10x5 ½

Tire Bender, Upsetters, &c.
Stockholm's Lightning Tire Upsetters.....dis 15 ½
Detroit Perfect Tire Bender.....dis 15 ½

Tobacco Cutters.
Enterprise Mfg. Co. (Champton).....dis 20x10 @ 30 ½
Wood Bottom.....doz \$5.00, do \$5.25
All Iron.....doz \$4.25
Walsworth Lock Co.'s.....doz \$18.00, dis \$5 @ 55 ½
Wilson's.....doz \$24, dis 55x10 ½
Acme.....doz \$20.00, dis 40 ½

Transom Lifters
Wollensak's Class 3 and 4, Bronzed Iron.....dis 50 ½
Wollensak's Class 3 and 4, Bronze Metal.....dis 25 ½
Wollensak's Class 3 and 4, Brass.....dis 35 ½
Wollensak's Skylight Lifters.....dis 50 ½
Crown, Eagle and Shield.....dis 50 ½
Reiber's bronzed Iron Rods list Jan. 1, 1887, dis 60x2 ½
Reiber's Real Bronze or Nickel Plate.....dis 50x2 ½
Excelsior.....dis 50x10x2 ½
Shaw's.....dis 50x10 ½
Fowler's Universal.....dis 40 @ 40x10 ½

Traps.
Game—
Newhouse.....dis 35 @ 40x2 ½
Oneida Pattern.....dis 70 @ 70x2 ½
Game, Blake's Patent.....dis 40x10x2 ½

Mouse and Rat.
Mousetrap Choker.....\$ doz holes, 11x12 ½
Mouse, Round Wire.....\$ doz \$1.50, dis 10 ½
Mouse, Cage, Wire.....\$ doz \$2.50, dis 10 ½
Mouse, Catch-em-alive.....\$ doz \$2.50, dis 15 ½
Mouse, Bonanza.....\$ gross 10 ½

Rat, "Decey"	* gross \$18.00, dis 15
Ideal	* gross \$10.00, dis 10
Cyclone	* gross \$6.25
Hotchicks Metallic Mouse, 5-hole trans... *	dos 90
In full cases	do 75
Trowels.—Lothrop's Brick and Plastering..	dis 32
Reed's Brick and Plastering	dis 15
Distont's Brick and Plastering	dis 35 @ 25-10
Peace's Plastering	dis 25
Clement & Maynard's	dis 20
Rose's Brick	dis 15 @ 20
Braze's Brick	dis 25
Worrall's Brick and Plastering	dis 20
Geric	dis 70
Trucks, Warehouse, &c.	dis 35
B. & L. Block Co.'s list, 1882	dis 40
Trunks, Roller,—See Pipe	
Twine,	BC. B.
No. 9, Flax Twine, $\frac{1}{4}$ and $\frac{1}{2}$ Balls	22½ 30½
No. 12, " " " " " " " " " "	" 24 28
No. 18, " " " " " " " " " "	" 18 23½
No. 24, " " " " " " " " " "	" 18 23½
No. 30, " " " " " " " " " "	" 16 27½
No. 36, " " " " " " " " " "	" 16 27½
No. 204, Mattress, " " " " " " " "	48 60
Chalk Line, Cotton, $\frac{1}{4}$ and $\frac{1}{2}$ Balls	25
Mason Line, Linen, " " " " " " " "	55
2-Ply Hemp, $\frac{1}{4}$ and $\frac{1}{2}$ Balls (spring Twine)..	12 13½
3-Ply Hemp, $\frac{1}{4}$ and $\frac{1}{2}$ Balls	11 11½
Cotton Wrapping, 5 Balls to a lb	15 @ 10
Jute, 3, 4 and 6 Ply Jute, $\frac{1}{4}$ and $\frac{1}{2}$ Balls ..	6½ @ 6½
Wool	15 @ 10
Cotton Ropes—6, 9, 12 and 15 lb to doz.	15 @ 10
Vices.	
Solid Box	dis 60 @ 67½
Fisher & Norris Double Screw	dis 15-10
Stephens'	dis 25 @ 30
Parker's	dis 20 @ 25
Wilson's	dis 40
Howard's	dis 40
Bonney's	dis 40-10
Millers Falls	dis 40 @ 42½
Trenton	dis 40-25 @ 40-10
Merrill's	dis 60-10-10
Sargent's	dis 60-10-10
Double Screw Vise	dis 15-10
Prentiss	dis 30-25 @ 35
Simpson's Adjustable	dis 40
Saw Filers—	
Bonney's, Nos. 2 & 3	* dos \$15.00, dis 2 10
Stearns'	* dos \$35.00, dis 33½ @ 10-10
Sargent's	dis 33½ @ 35
Hopkins'	* dos \$17.50, dis 10
Reading	dis 40-10
Wentworth	dis 20-10
Combination Hand Vise	* gro, \$42.00
Coleman's	dis 40
Bauer's Pipe Vises	dis 10
Wagon Boxes	
Per lb	2½
Wagon Jacks,—Daisy	* dos \$4.00, dis 25
Washer Cutters.	
Smith's Patent	* dos \$12.00, dis 20-10-10
Johnson's	* dos \$11.00, dis 33½
Fenny's	* dos Pol. \$14; Jan. \$10, dis 55
Bonney's	* dos \$15.00, dis 30-10
Washers.	
size	1 5-16 ¾ 1 ¾ 2 ¼ 3 ¼ 3 ½
Washers	7 5¼ 1¼ 3¼ 2¼ 3¼ 3½
In lots less than 200 lb., * by, add ¼¢, 5-lb boxes 1¢ to list.	
Edges.—Iron.	
Steel	dis 3½
Well Buckets, Galvanized.	
Hill's	* dos, 12 qt., \$4.25; 14 qt., \$5.25
Iron Clad	* dos, 14 qt., \$4.25; 14 qt., \$5.25
Whiting's Flat Iron Band	* dos \$4.25 @ \$4.50
Whiting's Wired Top	* dos \$4.25 @ \$5.25
Flat Wheels—3 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
Wire.	
Iron—	
Market, Br. & Ann., Nos. 0 to 18	dis 70-10-47½
Market, Coppered, Nos. 0 to 18	dis 70-10-75
Market, Galvanized, Nos. 0 to 18	dis 65-25
Market, Tin'd, Tinned List, Nos. 0 to 18 ..	dis 67½
Stone Br. & Ann'd, Nos. 16 to 18	dis 72½ @ 72½-35
Stone, Bright & Ann'd, Nos. 19 to 24	dis 75-75-25
Stone, Br. & Ann'd, Nos. 27 to 36	dis 75-10-25
Stone, Tin'd, Tin'd list, Nos. 18 to 36	dis 70-10-10
Tinned, Broome Wire, Nos. 18 to 24, dis 70	@ 70-10
Galvanized Fence	dis 45
Annealed Grape, Nos. 8 & 9	dis 75
Annealed Grape, Nos. 10 to 14	dis 75
Brass, lat. Jan. 18 '84	dis 15 @ 20
Cooper, lat. Jan. 18, 1884	dis 25
Baro Fence	See Trade Report
Wire on Spools	dis 40
Nailin's Brass and Copper Wire on Spools.	dis 30
Cast Steel Wire	dis 50
Stub's Steel Wire	\$6.00 to \$2, dis 30
Steel Wire, Nos. 12 to 30	dis 50
Secure	* dos \$10.00
Best Fire Safety Guide	* 1000 \$0.00, dis 25
Wire Clothes Lines. See Lines.	
Wire Cloth, Netting, &c.	
Painted Screen Cloth, No. 34, * 100 sq ft.....	\$1.00
Painted Screen Cloth, No. 33, * 100 sq ft.....	\$2.00
Galvanized Wire Netting	dis 70-10 @ 75
Wire Goods.—List May 1, 1886.	
Iron.	
Cast Steel	dis 30
Wrenches.—American Adjustable	dis 40
Baxter's Adjustable "B"	dis 40-2 @ 60
Baxter's Diagonal	dis 40-2 @ 50
Cox's "Mechanics"	dis 55-10-25
Girard Standard	dis 70-10
Machinists, Sterling Wrench Co.	dis 70-10
Lamson & Sessions' Engineers'	dis 60-10
Lamson & Sessions' Standard	dis 70-10
Grove Agricultural	dis 80
Lamson & Sessions' Agricultural	dis 80-25
Sterling Wrought	dis 35
Bemis & Call's Patent Combination	dis 35
Bemis & Call's Merrick's Pattern	dis 35
Bemis & Call's Briggs's Fatigue	dis 25
Bemis & Call's Clincher or Gas Pipe	dis 25
Bemis & Call's No. 3 Pipe	dis 35-25
Aiken's Pocket (Bright)	\$6.00, dis 50-10
The Favorite Pocket (Bright)	* dos \$4.00, dis 40
Weber's Patent Combination	dis 25
Boardman's	dis 21-10
Always Ready	dis 25-10
Allison's Engineer	dis 10-10
Donohue's Engineer	dis 10-10
Aemie, Bright	dis 1

CURRENT METAL PRICES.

DECEMBER 5, 1888.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
¾ to 2 in. round and square...	1.90 @ 2.00¢
1 to 6 in. x ¾ to 1 in.	
Refined Iron:	
¾ to 2 in. round and square...	2.10 @ ...
1 to 4 in. x ¾ to 1 in.	
4½ to 6 in. x ¾ to 1 in.	
1 to 6 in. x ¾ and 5-16	2.30 @ ...
Rods—¾ and 1-16 round and sq. ...	2.30 @ ...
Bands—1 to 6 x 3-16 to No. 12	2.30 @ 2.4¢
"Burden Best" Iron, base price	3.00 @ ...
Burden's "H. B. & S." Iron, base price	2.80 @ ...
"Uster"	3.10 @ ...
Norway Rods	4.00 @ 5.00¢

Merchant Steel from Store.

Open-Hearth and Bessemer Machinery,	
Toe Calk, Tire and Sleigh Shoe, base	
price in small lots	2½¢ @ 3¢
Best Cast Steel, base price in small lots	3½¢ @ 4½¢
Best Cast Steel Machinery, base price in	
small lots	3½¢ @ 5¢

For Classification and Extras adopted by the Merchant Steel Association of the United States, June 1, 1888, see *The Iron Age*, June 1, 1888.

Sheet Iron from Store.

Common American.	R. G. Cleaned.
10 to 16	2.75 @ 2.80¢
17 to 20	2.85 @ 3.00¢
21 to 24	3.00 @ 3.10¢
25 and 36	3.30 @ 3.50¢
27	3.35 @ 3.75¢
28	3.50 @ 4.00¢
B. F.	
Galv'd, 14 to 20	4.50 @ 4.75¢
Galv'd, 21 to 24	4.50 @ 4.75¢
Galv'd, 25 to 26	5.25 @ 5.12¢
Galv'd, 27	5.62½ @ 5.48¢
Galv'd, 28	6.00 @ 5.85¢
Patent Plinished	10¢ @ 10¢
Russia	9½¢ @ 10¢
American Cold Rolled B. B.	5¢ @ 7¢

English Steel from Store.

Best Cast	15¢ @ 15¢
Extra Cast	16½¢ @ 17¢
Swaged, Cast	15¢ @ 15¢
Best Double Shear	15¢ @ 15¢
Blister, 1st quality	12½¢ @ 12½¢
German Steel, best	10¢ @ 10¢
3d quality	9¢ @ 9¢
3d quality	8¢ @ 8¢
Sheet Cast Steel, 1st quality	15¢ @ 15¢
2d quality	14¢ @ 14¢
3d quality	12½¢ @ 12½¢

METALS.

Tin.

Banca, Pigs	25¢ @ 25¢
Straits, Pigs	25¢ @ 25¢
English, Pigs	24½¢ @ 24½¢
Straits in Bars	20¢ @ 20¢

Tin Plates.

Charcoal Plates.—Bright.	
Melyn Grade	10 x 14, \$5.75 @ \$6.00
"	12 x 12, 6.00 @ 6.25
"	14 x 20, 5.75 @ 6.00
"	20 x 28, 12.00 @ 12.50
"	10 x 14, 7.25 @ 7.50
"	12 x 12, 7.50 @ 7.75
"	14 x 20, 7.25 @ 7.50
"	20 x 28, 15.00 @ 15.50
"	12½ x 17, 5.50 @ 5.75
"	10 x 14, 7.00 @ 7.25
Call and Grade	10 x 14, 5.75 @ 6.00
"	12 x 12, 6.00 @ 6.25
"	14 x 20, 5.75 @ 6.00
"	20 x 28, 11.00 @ 11.50
"	10 x 14, 6.00 @ 6.25
"	12 x 12, 6.25 @ 6.50
"	14 x 20, 6.00 @ 6.25
"	20 x 28, 12.00 @ 13.00
"	12½ x 17, 4.75 @ 5.00
"	10 x 14, 5.75 @ 6.00
Coke Plates.—Bright.	
Steel Coke.—10 x 14, 14 x 20	\$4.75 @ \$5.00
"	10 x 20, 7.25 @ 7.50
"	20 x 28, 9.75 @ 10.25
"	10 x 14, 5.50 @ 5.75
BV Grade.—10 x 14, 14 x 20	4.40 @ 4.60
Charcoal Plates.—Tenne.	
Dean Grade.—10 x 14 x 20	\$4.40 @ \$4.62½
"	20 x 28, 9.00 @ 9.25
"	14 x 20, 4.40 @ 4.62½
"	20 x 28, 11.00 @ 11.37½
Abecarne Grade.—10 x 14 x 20	4.25 @ 4.50
"	20 x 28, 8.00 @ 8.50
"	14 x 20, 5.25 @ 5.50
"	20 x 28, 10.50 @ 10.80

Tin Boiler Plates.

1XX, 14 x 26	112 sheets, \$12.50 @ \$12.75
1XX, 14 x 28	112 sheets, 12.75 @ 13.00
1XX, 14 x 31	112 sh ets, 14.25 @ 14.50

Copper.

Duty: Pig. Bar and Ingot, 4¢: Old Copper, 3¢	
per lb. Manufactured (including all articles of	
which Copper is a component of chief value),	
45¢ ad valorem.	
Lake	@ 18½¢
"Anchor" Brand	@ 18¢

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound.							
			Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72	25	25	25	26	27	28	31	33	
30	72	25	25	25	26	27	28	30	34	
36	96	25	25	25	27	29	33	36		
36	96	25	25	25	28	30	34	38		
48	96	25	25	25	29	31	35			
48	96	25	25	25	30	32	36			
60	96	25	25	25	30	32	37			
60	96	25	25	25	31					
84	96	26	27							
84	96	27	29							
Over 84 in. wide		28	30							

All Bath Tub Sheets, 16 oz. 14 oz. 12 oz. 10 oz. Per pound, \$0.34 0.33 0.32 0.35

Bolt Copper, ¾ inch diameter and over, per pound, 25¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats. Per pound, 14 ounce to square foot and heavier, 28¢

12 ounce and up to 14 ounce to square foot, 29¢

10 ounce and up to 12 ounce, 31¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each, 25¢

Tinning sheets on one side, 30 x 60 each, 30¢

For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each, 15¢

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each, 12¢

For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each, 12¢

Tinning sheets on one side, other sizes, per square foot, 23¢

For tinning both sides double the above prices.

Planned Copper. Per pound, 10¢

Planned Copper List May 5, 1888, Net

Brass and Copper Tubes.

Seamless Copper. ¾ inch 50¢ ¾ inch 47¢

Seamless Brass. ¾ inch 44¢ ¾ inch 41¢

¾ inch 40¢ ¾ inch 37¢

¾ inch 36¢ ¾ inch 34¢

1 ¾ inch 37¢ 1 ¾ inch 34¢

1 ¾ inch 36¢ 1 ¾ inch 34¢

Discount from list, 10 @ 15 %

Spelter. Duty: Pig. Bars and Plates, \$1.50 per 100 lb.

Western Spelter, 5½¢ @ 6¢

"Bergenport" 5½¢ @ 6¢

"Bertha" 7¼¢ @ 8¢

Zinc. Duty: Sheet, 2½¢ per lb.

600 lb casks, 63¢

Per lb, 7½¢

Lead. Duty: Pig, 3¢ per 100 lb. Old Lead, 2¢ per lb. Pipe and Sheets, 3¢ per lb.

American, 4¼¢ @ 4½¢

Newark, 4¼¢ @ 4½¢

Bar, subject to trade discount, 3½¢

Tin-Lined Pipe, subject to trade discount, 1½¢

Block Tin Pipes, subject to trade discount, 45¢

Sheet, subject to trade discount, 7¼¢

Solder. ½ @ ¼ (Guaranteed), 10¢

Extra Wiping, 13½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony. Cookson, 13¼¢ @ 14¢

Hallett's, 11½¢

Plumbers' Brass Work. Discount per cent.

Ground Bibbs and Stops, 55¢ @ 10¢

Ground Stops, Hydrant Cocks, &c., 55¢ @ 10¢

Corporation Cocks, 55¢ @ 10¢

Corporation Cocks, "Mueller" Pattern, from Western list, 55¢ @ 10¢

Ground Basin and Shampooing Cocks, 50¢ @ 10¢

Compression Basin Cocks, 50¢ @ 10¢

Compression Basin and Sink Cocks, 50¢ @ 10¢

Compression Pantry Cocks, 50¢ @ 10¢

Compression Double Basin and Shampooing Cocks, 50¢ @ 10¢

Compression Double Bath Cocks, 50¢ @ 10¢

Compression Bibbs, Urinal Cocks, 50¢ @ 10¢

Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks, 50¢ @ 10¢

Basin Plugs and Basin Grates, 55¢ @ 10¢

Bath and Wash Tray Plugs, 55¢ @ 10¢

Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern

Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets, 55¢ @ 10¢

Basin Clamps, Basin Joints and Strainers 55¢ @ 10¢

Boiler Couplings, Ground Face, per set \$1.25, 10¢

Boiler Couplings, Plain Face, per set \$1.20, 10¢

Water Back Valve and Plain Couplings, Soldering Nipples and Unions, 55¢ @ 10¢

Union Joints, 60¢ @ 10¢

Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and

Guides, 55¢ @ 10¢

Hose Goods, 55¢ @ 10¢

Steam and Gas Fitters' Brass and Iron Work. Discount per cent.

Brass Globe Valves, 60¢ @ 10¢

Finished Brass Globe Valves, with Finished Brass Wheels, 40¢ @ 10¢

Brass Globe Valves, with Patent Wood Wheels, 60¢ @ 10¢

Brass Globe Angle and Corner Valves, 60¢ @ 10¢

Brass Radiator Angle Valves, 60¢ @ 10¢

Brass Radiator Angle Valves, Frink's Patent, 60¢ @ 10¢

Brass Cross and Check Valves, 60¢ @ 10¢

Brass Check Valves, 60¢ @ 10¢

Brass Hose Valves, 60¢ @ 10¢

Brass and Iron Frink Valves, 60¢ @ 10¢

Brass Safety Valves, 60¢ @ 10¢

Brass Vacuum Valves, 60¢ @ 10¢

Brass Whistle Valves, 60¢ @ 10¢

Brass Balance, Back Pressure and Foot Valves, 50¢ @ 10¢

Brass Butterfly and Throttle Valves, 50¢ @ 10¢

Brass Pump Valves, 50¢ @ 10¢

Brass Steam Cocks, 57½¢ @ 10¢

Brass Service, Meter and Union Meter Cocks, 57½¢ @ 10¢

Brass Whistles, Water Gauges and Oil Cups, 60¢ @ 10¢

Brass Hollow Plug, Tallow and Globe Oil Cups, 50¢ @ 10¢

Brass Lubricators, 60¢ @ 10¢

Brass Air Valves, 60¢ @ 10¢

Brass Air Cocks, 60¢ @ 10¢

Brass Gase Cocks, 55¢ @ 10¢

Brass Cylinder Cocks and Steam Bibbs, 50¢ @ 10¢

Brass Swing Joints and Expansion Joints, 50¢ @ 10¢

Brass Test Pumps, 50¢ @ 10¢

Brass Steam Fittings, Rough, 60¢ @ 10¢

Brass Steam Fittings, Finished, 3¢ @ 10¢

Brass Union Joints, 60¢ @ 10¢

Brass Soldering Unions and Nipples, 55¢ @ 10¢

Brass Hose Fittings, Fusible and Boiler Plugs, 55¢ @ 10¢

Iron Body Globe, Angle, Cross and Check Valves, 65¢ @ 10¢

Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves, 65¢ @ 10¢

Iron Cocks, all Iron, 65¢ @ 10¢

All Iron Valves, 65¢ @ 10¢

Miscellaneous. Discount per cent.

Cast Iron Fittings, 70¢ @ 10

Plugs and Bushings, 75¢ @ 10

Malleable Iron Unions, 67½¢

Malleable Iron Fittings, 35¢

Paints. Black, Lamp—Coach Painters' ... 22¢ @ 24¢

Ordinary, 6¢

Black, Ivory Drop, fair, 12 @ 15¢

"best, 24¢

Black Paint, in oil, kegs, 8¢; assorted cans, 11¢

Blue, Prussian, fair to best, 40 @ 55¢

"in oil, 45 @ 55¢

"Chinese dry, 70¢

"Ultramarine, 18 @ 30¢

Brown, Spanish, 14¢

"Van Dyke, 10 @ 12¢

Dryers, Patent American